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THE IBIS,

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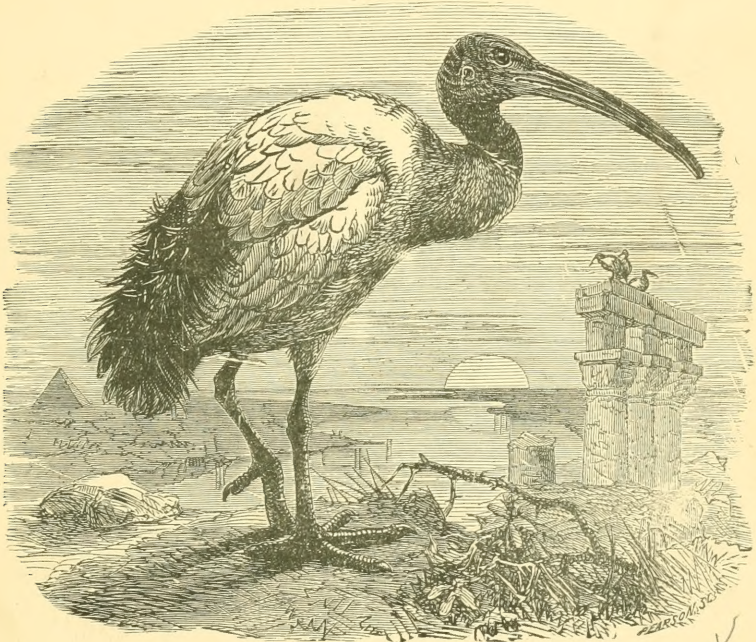
QUARTERLY JOURNAL OF ORNITHOLOGY.

EDITED BY

WILLIAM LUTLEY SCLATER, M.A., F.Z.S.



VOL. II. 1920.

ELEVENTH SERIES.

He prayeth well, who loveth well
Both man and bird and beast.

Smithsonian Institution
254359
National Museum.

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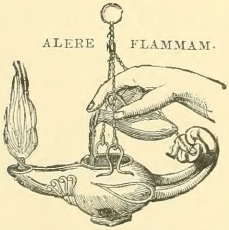
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VOLUME II.

Number	1.	issued	January	26th.
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,,	3.	,,	July	1st.
,,	4.	,,	October	15th.

LIST OF THE MEMBERS

OF THE

BRITISH ORNITHOLOGISTS' UNION.

1920.

[An asterisk indicates an Original Member. It is particularly requested that Members should give notice to the Secretary of the Union of any error in their addresses or descriptions in this List, in order that it may be corrected.]

Date of Election.

1916. Adams, Ernest Edward; Lloyd's, Royal Exchange, E.C. 3.

1914. Aldworth, Capt. Thomas Preston, D.S.O., 3rd Battn., West Kent Regt., Mesopotamia.

1911. Alexander, Horace Gundry; Woodbroke, Selby Oak, Birmingham.

1920. Andrews, William Henry Makens; Hethersett, Norwich.

5 1888. Aplin, Oliver Vernon; Stonehill House, Bloxham, Oxon.

1919. Archer, Sir Geoffrey Frances, K.C.M.G.; Government House, Berbera, Somaliland.

1896. Archibald, Charles F.; 2 Darnley Road, West Park, Leeds, Yorks.

1919. Arnold, Edwin Carleton; The College, Eastbourne.

1896. Arrigoni degli Oddi, Count Ettore, Professor of Zoology, University, Padua; and Ca'oddo, Monselice, Padua, Italy.

10 1901. Arundel, Major Walter B., F.Z.S.; High Ackworth, Pontefract, Yorks.

1915. Ashby, Edwin; Wittunga, Blackwood, Adelaide, S. Australia.

1901. Ashby, Herbert; Broadway House, Brookvale Road, Southampton.

1908. Ashworth, John Wallwork, M.R.C.S., L.R.C.P., F.R.G.S., F.G.S.; Thorne Bank, Heaton Moor, near Stockport, Cheshire.

1918. Astley, Arthur; Freshfield, Ambleside, Westmoreland.

Date of Election.

15 1897. Astley, Hubert Delaval, M.A., F.Z.S.; Brinsop Court, Hereford.

1919. Backhouse, Thomas Porter; Trinity College, Cambridge; and 24 Green Street, Cambridge.

1901. Bailward, Brig.-General Arthur Churchill, F.Z.S. (R.F.A.); 1 Princes Mansions, Victoria Street, S.W. 1.

1892. Baker, E. C. Stuart, J.P., O.B.E., F.Z.S., F.L.S., C.F.A.O.U.; 6 Harold Road, Upper Norwood, S.E. 19. (*Hon. Secretary and Treasurer.*)

1901. Baker, John C., M.B., B.A.; Ceely House, Aylesbury, Bucks.

20 1906. Bannerman, David A., M.B.E., B.A., F.R.G.S.; 6 Palace Gardens Terrace, Kensington, W. 8; and British Museum (Nat. Hist.), Cromwell Road, S.W. 7.

1890. Barclay, Francis Hubert, F.Z.S.; The Warren, Cromer, Norfolk.

1885. Barclay, Hugh Gurney, F.Z.S.; Colney Hall, Norwich, Norfolk.

1903. Bartels, Max.; Pasir Datar, Halte Tjisaät (Preanger), Java, Dutch East Indies.

1906. Bates, George L., C.M.Z.S.; Bitye, *viâ* Yaunde, Cameroon, West Africa.

25 1913. Baynes, George Kenneth; 120 Warwick Street, S.W. 1.

1912. Beebe, William, C.M.Z.S.; Tropical Research Station of the New York Zoological Society, Katabo, Bartica District, British Guiana.

1910. Beeston, Harry; Sunnymead, South Street, Havant, Hants.

1920. Belcher, Charles F.; Zomba, Nyasaland.

1897. Benson, John.

30 1897. Berry, William, B.A., LL.B.; Tayfield, Newport, Fifeshire.

1917. Bertram-Jones, John William; Kelvedon Hall, Brentwood, Essex.

1914. Betham, Brigadier-General Robert M.; c/o Bank of Bombay, Post Box No. 13, Bombay.

1907. Bethell, The Hon. Richard, F.Z.S. (Scots Guards); 12 Manchester Square, W. 1.

1920. Beveridge, Frederick Spencer; St. Leonards Hill, Dumfermline.

35 1907. Bickerton, William, F.Z.S.; Kingsmuir, 21 Oxhey Road, Watford, Herts.

1880. Bidwell, Edward; 1 Trig Lane, Upper Thames Street, E.C. 4.

Date of Election.

1919. Bigger, Capt. William Kenneth, M.C., R.A.M.C.; The Croft, Mitcham, Surrey; and P.M.O., Nazareth, Palestine.

1892. Bird, The Rev. Maurice C. H., M.A.; Brunstead Rectory, Stalham, S.O., Norfolk.

1891. Blaauw, Frans Ernst, C.M.Z.S.; Gooilust, 's Graveland, Hilversum, Noord-Holland.

40 1913. Blackwood, Lt. George Glendinning, M.C. (Seaforth Highlanders); 1 Blackness Crest, Dundee, N.B.

1912. Blaine, Capt. Gilbert, F.Z.S.; 5a The Albany, Piccadilly, W. 1.

1903. Blathwayt, The Rev. Francis Linley, M.A.; Melbury Rectory, Dorchester, Dorset.

1914. Blyth, Robert Oswald, M.A.; Oaklands, Stanmore, Middlesex.

1897. Bonar, The Rev. Horatius Ninian, F.Z.S.; 16 Cumin Place, Edinburgh.

45 1905. Bone, Henry Peters.

1894. Bonhote, John Lewis, M.A., F.L.S., F.Z.S.; Park Hill House, Carshalton.

1906. Boorman, Staines; Heath Farm, Send, Woking, Surrey.

1904. Booth, Harry B., F.Z.S.; Rybill, Ben Rhydding, *viâ* Leeds, Yorks.

1920. Borman, Major Frank William; 43*a* Bow Lane, E.C. 4; and M.G.C. (1), The Residency, Cairo.

50 1908. Borrer, Clifford Dalison; 6 Durham Place, Chelsea, S.W. 3.

1918. Boyd, Capt. Arnold Whitworth, M.C. (Lancashire Fusiliers); Frandley House, Northwich.

1915. Bradford, Arthur Danby, F.Z.S.; Upton Lodge, Watford, Herts.

1895. Bradford, Sir John Rose, K.C.M.G., C.B., M.D., D.Sc., F.R.S., F.Z.S; 8 Manchester Square, W. 1.

1909. Briggs, Thomas Henry, M.A., F.E.S.; Rock House, Lynmouth, R.S.O., N. Devon.

55 1902. Bristowe, Bertram Arthur; Ashford Farm, Stoke D'Abernon, Cobham, Surrey.

1919. Brocklebank, Lt.-Col. H.; 63 Witbury Road, Hove, Sussex.

1908. Brook, Edward Jonas, F.Z.S.; Hoddam Castle, Ecclefechan, Dumfriesshire.

Date of Election.

1899. Brooke, John Arthur, J.P.; Fenay Hall, Huddersfield; and Fearn Lodge, Ardgay, Ross-shire.

1920. Brooks, Major Allan, D.S.O.; Okanagan Landing, British Columbia.

60 1912. Brown, Thomas Edward; c/o Messrs. G. Beyts & Co., 11 Port Tewfik, Suez, Egypt.

1900. Bruce, William Speirs, LL.D., F.R.S.E.; Scottish Oceanographical Laboratory, Surgeon's Hall, Edinburgh.

1911. Buchanan, Captain Edward Mackenzie Murray; Leny, Callandar.

1907. Buckley, Charles Mars; 4 Hans Crescent, S.W. 1.

1906. Bucknill, Sir John Alexander Strachey, K.C., M.A., F.Z.S.; Supreme Court, Patna, India; and Athenæum Club, Pall Mall, S.W. 1.

65 1908. Bunyard, Percy Frederick, F.Z.S.: 57 Kidderminster Road, Croydon, Surrey.

1907. Butler, Arthur Gardiner, Ph.D., F.L.S., F.Z.S.; 124 Beckenham Road, Beckenham, Kent.

1899. Butler, Arthur Lennox, F.Z.S.: St. Leonard's Park, Horsham, Sussex.

1900. Buttress, Bernard A. E.; Craft Hill, Dry Drayton, Cambridge.

1905. Buxton, Anthony; Knighton, Buckhurst Hill, Essex.

70 1912. Buxton, Patrick Alfred; 31 Grange Road, Cambridge.

1896. Cameron, Major James S. (2nd Bn. Royal Sussex Regt.); Low Wood, Bethersden, Ashford, Kent.

1888. Cameron, John Duncan; Low Wood, Bethersden, Ashford, Kent.

1909. Campbell, David Callender, J.P.; Templemore Park, Londonderry, Ireland.

1909. Carroll, Clement Joseph; Rocklow, Fethard, Co. Tipperary, Ireland.

75 1904. Carruthers, Alexander Douglas; Barmer Hall, Kings Lynn, Norfolk.

1908. Carter, Thomas; Wensleydale, Mulgrave Road, Sutton, Surrey.

1890. Cave, Capt. Charles John Philip, M.A., F.Z.S.; Ditcham Park, Petersfield, Hants.

1919. Chance, Edgar P.; 9 Hay Hill, Berkeley Square, W. 1.

1882. Chase, Robert William; Herne's Nest, Bewdley, Worcestershire.

Date of Election.

80 1908. Cheesman, Major Robert E.; 127 Chene Walk, Chelsea, S.W. 10.

1910. Chubb, Charles, F.Z.S.; British Museum (Natural History), Cromwell Road, S.W. 7.

1918. Chubb, Capt. Patrick Arthur; c/o Messrs. David Sassoon & Co., Calcutta, India.

1912. Clark, George Wingfield, M.A., F.Z.S.; "Homeland," Lode, Cambridge.

1904. Clarke, Major Goland van Holt, D.S.O., F.Z.S.; Chilworth Court, Romsey, Hants.

85 1916. Clarke, John Philip Stephenson; Borde Hill, Cuckfield, Sussex.

1889. Clarke, Col. Stephenson Robert, C.B., F.Z.S.; Borde Hill, Cuckfield, Sussex.

1880. Clarke, William Eagle, I.S.O., LL.D., F.L.S., F.R.S.E.; Royal Scottish Museum, Edinburgh. (*President.*)

1904. Cochrane, Capt. Henry Lake, R.N.; Walton Manor, Bletchley, Bucks.

1898. Cocks, Alfred Heneage, M.A., F.Z.S.; Poynetts, Skirmett, near Henley-on-Thames, Oxon.

90 1895. Coles, Richard Edward; Rosebank, New Milton, S.O., Hants.

1911. Collett, Anthony Keeling; 5 Stone Buildings, Lincoln's Inn, W.C. 2.

1904. Collier, Charles, F.Z.S.; Bridge House, Culmstock, Devon; and Windham Club, St. James' Square, S.W. 1.

1919. Collinge, Dr. Walter Edward, D.Sc., M.Sc., F.L.S. F.E.S.; The University, St. Andrews, Scotland.

1916. Coltart, Dr. Henry Neville; Field House, Epsom, Surrey.

95 1909. Congreve, Capt. William Maitland, M.C.; The Forest, Kerry, Montgomeryshire.

1913. Cook, James Pemberton; Kiora, Kyambu, British East Africa.

1914. Courtois, The Rev. F. L., S.J.; Director of the Sikawei Museum, near Shanghai, China.

1913. Cowan, Francis; Wester Lea, Murrayfield, Midlothian.

1920. Coward, Thomas Alfred, F.Z.S., F.E.S.; Brentwood, Bowdon, Cheshire.

100 1894. Crewe, Sir Vauncey Harpur, Bt.; Calke Abbey, Derby.

Date of
Election.

1917. Cunningham, Josias, R.N.V.R.; Fernhill, Belfast.

1916. Currie, Algernon James; Assistant Audit Officer, S.P.R., Kerman, *viâ* Bunder Abbas, S. Persia.

1915. Currie, Robert Alexander (Chinese Customs); The Custom House, Ningpo, China.

1899. Curtis, Frederick, F.R.C.S.; Lyndens, Redhill, Surrey.

105 1896. Danford, Major Bertram W. Y., R.E.; c/o Messrs. Cox & Co., 16 Charing Cross, S.W. 1.

1883. Davidson, James, F.Z.S.; 32 Drumsheugh Gardens, Edinburgh.

1905. Davis, K. J. Acton, M.C., F.R.C.S., F.Z.S.; 24 Upper Berkeley Street, W. 1.

1920. Delacour, Jean; Chateau de Cleres, Seine Inférieure, France.

1909. Delmé-Radcliffe, Capt. Alfred (105th Maratha Light Infantry); c/o Messrs. Cox & Co., Bombay, India.

110 1920. Delmé-Radcliffe, Lt.-Col. Henry; Vine Cottage, Wimborne, Dorset.

1902. Dent, Charles Henry; c/o Messrs. Barclay & Co. Ltd., Darlington, Durham.

1916. Despott, Giuseppe, Curator of the Natural History Museum, The University, Malta.

1893. De Winton, William Edward, F.Z.S.; Southover Hall, Burwash, Sussex.

1896. Dobbie, James Bell, F.R.S.E., F.Z.S.; 12 South Inverleith Terrace, Edinburgh.

115 1889. Dobie, William Henry, M.R.C.S.; 2 Hunter Street, Chester.

1920. Donald, Charles Hilliard; Director of Fisheries, Dharmsala, Punjab, India.

1904. Drake-Brockman, Ralph Evelyn, M.R.C.S., L.R.C.P., F.Z.S.; Studland House, Lansdowne Road, Worthing.

1913. Drummond, James, F.L.S., F.Z.S.; 'Lyttelton Times, Christchurch, New Zealand.

1890. Drummond-Hay, Col. James A. G. R.- (Coldstream Guards); Seggieden, by Perth.

120 1904. Duckworth, George Herbert; Dalingridge Place, *viâ* East Grinstead, Sussex.

1878. Durnford, W. Arthur, J.P.; Elsecar, Barnsley, Yorks.

1903. Earle, Edward Vavasour; "Riverside," South Darenth, Kent.

Date of Election.

1914. Edwards, Laurence Albert Curtis, M.A.; 61 Elphinstone Road, Hastings.

1895. Elliot, Edmund A. S., M.R.C.S.; Woodville, Kingsbridge, South Devon.

125 1884. Elliott, Algernon, C.I.E.; 41 Stanley Gardens, Hampstead, N.W. 3.

1902. Ellison, The Rev. Allan, M.A.; Rochford Rectory, Tenbury Wells, Worcestershire.

1866. Elwes, Henry John, F.R.S., F.Z.S.; Colesborne, Cheltenham, Gloucestershire. (*Committee.*)

1914. Etheridge, Robert, Junr., C.M.Z.S.; Curator of the Australian Museum, Sydney, New South Wales, Australia.

1920. Evans, Lt.-Commander Arthur, R.N.; H.M.S. 'Vimeria,' c/o G.P.O., London.

130 1879. Evans, Arthur Humble, M.A., F.Z.S.; 9 Harvey Road, Cambridge.

1888. Evans, William, F.R.S.E.; 38 Morningside Park, Edinburgh.

1916. Ezra, Alfred, F.Z.S.: 110 Mount Street, W. 1.

1892. Fairbridge, William George; 141 Long Market Street, Capetown, South Africa.

1916. Falkiner, Capt. John McIntire, I.M.S., F.R.C.S.; 22 St. Stephen's Green, Dublin.

135 1909. Fanshawe, Capt. Richard D. (late Scots Guards); Broxmore, Cavendish Road, Bournemouth.

1894. Farquhar, Admiral Sir Arthur Murray, K.C.B., C.V.O.; Acheron, Aboyne, N.B.

1898. Farquhar, Rear-Admiral Stuart St. J., R.N.; Naval & Military Club, Piccadilly, W. 1.

1873. Feilden, Col. Henry Wemyss, C.B., C.M.Z.S.; Burwash, Sussex; and Junior United Service Club, S.W. 1.

1901. Finlinson, Horace W., F.Z.S.; 5 Rosamond Road, Bedford.

140 1885. Fitzherbert-Brockholes, William Joseph; Claughton Hall, Garstang, Lancashire.

1902. Flower, Major Stanley Smyth, F.Z.S.; Kedah House, Zoological Gardens, Giza, Egypt.

1912. Floyd, James Francis Murray, B.A.; The University, Glasgow.

1912. Foster, Arthur H., M.R.C.S., L.R.C.P.; Sussex House, 88 Tilehouse Street, Hitchin, Herts.

Date of
Election.

1903. Foster, Nevin Harkness, F.L.S., M.R.I.A.; Hillsborough, Co. Down, Ireland.

145 1880. Foster, William; 39 Colville Gardens, Bayswater, W. 11.

1881. Freke, Percy Evans; South Point, Limes Road, Folkestone.

1895. Frohawk, Frederick William, F.E.S.; Uplands, Thundersley, Essex.

1909. Frost, William Edward, J.P.; Ardvreck, Crieff, Perthshire.

1881. Gadow, Hans, Ph.D., F.R.S., F.Z.S.; Cleramendi, Great Shelford, near Cambridge.

150 1886. Gainsborough, Charles William Francis, Earl of; Exton Park, Oakham, Rutland.

1907. Gandolfi, Alfonso Otho Gandolfi-Hornyold, Duke, Ph.D.; Blackmore Park, Hanley Swan, Worcestershire.

1900. Garnett, Charles, F.Z.S.; Greathouse, Chippenham, Wilts; and New University Club, St. James's Street, S.W. 1.

1892. Gerrard, John; Silverdale, Worsley, near Manchester, Lancs.

1902. Gibbins, William Bevington, F.Z.S.; Ettington, Stratford-on-Avon, Warwickshire.

155 1902. Gillman, Arthur Riley; Hatch End, Wilfred Road, Boscombe.

1919. Gillon, Mrs. Nina; 14 Carlton Terrace, Edinburgh.

1903. Gladstone, Capt. Hugh Steuart, M.A., F.Z.S., F.R.S.E., F.S.A.Scot.; Capenoch, Thornhill, Dumfriesshire; and 40 Lennox Gardens, S.W. 1.

1908. Godman, Lt.-Col. Edward Shirley (2nd Dorset Regiment); Hampsteel, Cowfold, Sussex.

*1858. Godman, Percy Sanden, B.A., C.M.Z.S.; Hampsteel, Cowfold, Sussex. (*Gold Medallist.*)

160 1906. Goodall, Jeremiah Matthews; The Nest, Bembridge, Isle of Wight.

1900. Goodfellow, Walter, F.Z.S.; The Poplars, Kettering, Northants.

1920. Gordon, Mrs. Audrey; Otterburn Tower, Otterburn, Northumberland.

1906. Gordon, Seton Paul, F.Z.S.; Auchintoul, Aboyne, Aberdeenshire.

1912. Gosse, Major Philip, M.R.C.S., L.R.C.P., R.A.M.C.; Savile Club, Piccadilly, W. 1.

165 1899. Gould, Francis Herbert Carruthers, F.Z.S.; Matham Manor House, East Molesey, Surrey.

1895. Grabham, Oxley, M.A.; The Museum, York.

Date of Election.

1920. Graham, Major Claude; Northampton Regt., Army and Navy Club, Pall Mall, S.W. 1; and Talodi, Nuba Mts. Province, Sudan.

1909. Grant, Major Claude Henry Baxter, F.Z.S. (6th Battn. Rifle Brigade); 2 Lebanon Gardens, West Hill, Wandsworth, S.W. 18; and Sports Club, St. James' Square, S.W. 1.

1918. Grant, Francis; 22 Bushmead Avenue, Bedford.

170 1913. Greening, Linnæus, F.L.S., F.Z.S.; Fairlight, Grappenhall, near Warrington, Cheshire.

1909. Grey of Falloden, The Rt. Hon. Edward, The Viscount, K.G., P.C., F.Z.S.; Falloden, Christon Bank, R.S.O., Northumberland.

1906. Griffith, Arthur Foster; 59 Montpellier Road, Brighton, Sussex.

1920. Griscom, Ludlow, 37 Fifth Avenue, New York, U.S.A.

1885. Guillemard, Francis Henry Hill, M.A., M.D., F.Z.S.; Old Mill House, Trumpington, Cambridge.

175 1908. Gurney, Gerard Hudson, F.Z.S., F.E.S.; Keswick Hall, Norwich, Norfolk.

1870. Gurney, John Henry, F.Z.S.; Keswick Hall, Norwich; and Athenæum Club, Pall Mall, S.W. 1.

1896. Gurney, Robert, F.Z.S.; Ingham Old Hall, Stalham, Norfolk.

1891. Haigh, George Henry Caton, F.Z.S.; Grainsby Hall, Great Grimsby, Lincolnshire.

1887. Haines, John Pleydell Wilton; 17 King Street, Gloucester.

180 1898. Hale, The Rev. James Rashleigh, M.A.; Boxley Vicarage, Maidstone, Kent.

1905. Hamerton, Lt.-Col. Albert Edward, C.M.G., D.S.O., R.A.M.C., F.Z.S.; A.D.P., Mesopotamia, Central Laboratory, Baghdad.

1913. Hardy, Capt. Ernest Clifford, R.N.; Woolage Green Farm, Womenswold, nr. Canterbury, Kent.

1900. Harper, Edmund William, F.Z.S.; 6 Ashburnham Road, Bedford.

1900. Harris, Henry Edward.

185 1893. Hartert, Ernst J. O., Ph.D., F.Z.S.; The Zoological Museum, Tring, Herts.

Date of Election.

1900. Hasluck, Percy Pedley Harford; The Wilderness, Southgate, N. 14.

1898. Hawker, Richard Macdonnell, F.Z.S.; Bath Club, Dover Street, W. 1; and c/o Messrs. Dalgety & Co., 96 Bishopsgate, E.C. 2.

1905. Hawkshaw, John Clarke, M.A., M.I.C.E., F.G.S.; Hollycombe, Liphook, Hants; and 33 Great George Street, Westminster, S.W. 1.

1918. Herbert, Capt. Edward Grevile, R.A.F.; c/o Messrs. Cox & Co., R.A.F. Branch, 111 St. Martin's Lane, W.C. 2; and Bangkok, Siam.

190 1902. Hett, Geoffrey Seccombe, M.B., F.Z.S.; 8 Wimpole Street, W. 1.

1913. Hewitt, John, M.A.; Director of the Albany Museum, Grahamstown, South Africa.

1900. Hills, Lt.-Col. John Waller; 98 Mount Street, W. 1.

1884. Holdsworth, Charles James, J.P.; Fernhill, Alderley Edge, Cheshire.

1920. Holland, Eardley, F.R.C.S.; 55 Queen Anne Street, Cavendish Square, W. 1.

195 1912. Hony, George Bathurst; 4 Beaufort Road, Clifton, Bristol.

1905. Hopkinson, Emilius, M.B., D.S.O., F.Z.S.; 45 Sussex Square, Brighton, Sussex.

1916. Hopwood, Cyril (Indian Forests); c/o Messrs. Thos. Cook & Son, Rangoon, Burma.

1888. Horsfield, Herbert Knight; Crescent Hill, Filey, Yorks.

1895. Howard, Henry Eliot, F.Z.S.; Clarelands, near Stourport, Worcestershire.

200 1881. Howard, Robert James; Shearbank, Blackburn, Lancashire.

1911. Hudson, Edward; 15 Queen Anne's Gate, S.W. 1.

1911. Hudson, Reginald; 16 Warwick Road, Stratford-on-Avon.

1920. Humphreys, Georre Rayner; Ivy Lodge, Drumcondra, Dublin.

1920. Huxham, Engr.-Lt.-Commdr. Harold Hugh, D.S.O., R.N.; H.M.S. 'Penelope,' Chatham; and Hillsboro Hill Lane, Southampton.

205 1918. Inglis, Charles McFarlane; Baghownie Factory, Laheria, Serai P.O. Behar, India.

Date of
Election.

1901. Ingram, Capt. Collingwood, F.Z.S.; Forest House, Westgate-on-Sea, Kent.

1902. Innes Bey, Dr. Walter Francis; Curator of the Zoological Museum, School of Medicine, Cairo, Egypt.

1913. Iredale, Tom; 39 Northcote Avenue, Ealing, W. 5.

1888. Jackson, Sir Frederick John, K.C.M.G., C.B., F.L.S., F.Z.S.; Evergreens, Lyndhurst, Hants.

210 1892. James, Henry Ashworth, F.Z.S.; Hurstmonceux Place, Hailsham, Sussex.

1920. Janson, Charles Milford; 6 Hyde Park Square, W. 2.

1896. Jesse, William, B.A., F.Z.S.; Meerut College, Meerut, India.

1891. Johnston, Sir Harry Hamilton, G.C.M.G., K.C.B., F.Z.S.; St. John's Priory, Poling, near Arundel, Sussex.

1920. Jones, Alexander Edward; Tattersall House, Ambala, India.

215 1900. Jones, Major Henry, F.Z.S. (late 62nd Regt.); 41 Vineyard Hill Road, Wimbledon Park, S.W. 19.

1909. Jones, Surgeon-Commander Kenneth Hurlstone, M.B., Ch.B., F.Z.S., R.N.; Medical Transport Office, Royal Naval Barracks, Chatham.

1899. Jourdain, The Rev. Francis Charles Robert, M.A.; Appleton Rectory, Abingdon, Berks.

1902. Joy, Norman Humbert, M.R.C.S., L.R.C.P.; Theale, Berks.

1880. Kelham, Brigadier-General Henry Robert, C.B. (late Highland Light Infantry); Army and Navy Club, Pall Mall S.W. 1.

220 1894. Kelsall, Lt.-Col. Harry Joseph, R.A.; c/o Messrs. Cox & Co., 16 Charing Cross, S.W. 1.

1897. Kelsall, The Rev. John Edward, M.A.; Milton Rectory, New Milton, Hants.

1904. Kelso, John Edward Harry, M.D.; Braeside, Edgewood, Lower Arrow Lake, British Columbia.

1914. Kennedy, Capt. John Noble, M.C., R.G.A.; The Manse, Port Patrick, Wigtownshire, Scotland; and United Service Club, S.W. 1.

1891. Kerr, John Graham, F.R.S., F.Z.S., Regius Professor of Zoology; 9 The University, Glasgow.

225 1895. Kingsford, William Edward; Cairo, Egypt.

Date of Election.

1902. Kinnear, Norman Boyd, C.M.Z.S.; c/o Messrs. Grindlay & Co.; 54 Parliament Street, S.W. 1.

1910. Kloss, Cecil Boden, F.Z.S., F.R.A.I.; Assistant Director of Museums, Kuala Lumpur, Federated Malay States.

1892. Laidlaw, Thomas Geddes; Bank of Scotland House, Duns, Berwickshire.

1913. Lambert, Godfrey Charles; Woodcote, Esher, Surrey.

230 1917. Lampard-Vachell, Benjamin Garnet; The Cottage, Rudgwick, Sussex.

1884. Langton, Herbert; St. Moritz, 61 Dyke Road, Brighton, Sussex.

1881. Lascelles, The Hon. Gerald William, F.Z.S.; Tillington House, Petworth, Sussex.

1892. La Touche, John David Digues, C.M.Z.S.; c/o Custom House, Mengtze, Yunnan, China.

1898. Learoyd, A. Ernest; 6 Lowndes Street, S.W. 1.

235 1910. Lemon, Mrs. Margaretta Louisa, F.Z.S.; Hillcrest, Redhill, Surrey.

1898. Le Souëf, Dudley, C.M.Z.S.; Director of the Zoological Gardens, Melbourne, Victoria, Australia.

1897. Lilford, John, Lord, F.Z.S.; Lilford Hall, Oundle, Northants.

1909. Lings, George Herbert; Richmond Hill, Cheadle, Cheshire.

1897. Lodge, George Edward, F.Z.S.; Hawkhouse, Park Road, Camberley, Surrey.

240 1908. Long, Sydney Herbert, M.D., F.Z.S.; 31 Surrey Street, Norwich, Norfolk.

1919. Longstaff, Capt. Tom George, M.A., M.D., F.Z.S.; Samalaman, Lochailort R.S.O., Inverness-shire; and the Athenæum, Pall Mall, S.W. 1.

1904. Lowe, Percy R., B.A., M.B., B.C.; British Museum (Nat. Hist.), Cromwell Road, S.W. 7. (*Committee.*)

1914. Lowe, Willoughby Prescott; Gorsemoor, Throwleigh, Okehampton, Devon.

1920. Loyd, Captain Lewis Richard William; The Lookout, Branscombe, Beer S.O., S. Devon.

245 1920. Ludlow, Frank, M.A.; c/o Messrs. Cox & Co., Bankers, Karachi, India; and Priory Gate, Dunster, Somerset.

1920. Luke, Leonard Percival; 9 Piggott Street, Brighouse, Yorks.

Date of
Election.

1904. Lynes, Captain Hubert, C.B., C.M.G., R.N.; 23 Onslow Gardens, South Kensington, S.W. 7.

1920. Mackenzie, Colonel Alexander Francis, C.M.G., M.V.O. (late Argyle & Sutherland Highlanders); Ord House, Muir of Ord, N.B.

1917. Mackenzie, John Mitchell Douglas, B.A., C.M.Z.S., Indian Forest Service; c/o Thos. Cook & Son, Rangoon, Burma, India; 6 The Circus, Bath.

250 1916. Mackworth-Praed, Cyril W. (Scots Guards); Dalton Hill, Albury, Surrey.

1906. Macmillan, William Edward Frank; 42 Onslow Square, S.W. 7.

1920. Madoc, Lieut.-Colonel Henry William; Ashfield, Douglas, Isle of Man.

1906. Magrath, Lt.-Col. Henry Augustus Frederick (51st Sikhs, F.F.); c/o Messrs. H. S. King & Co., 9 Pall Mall, S.W. 1.

1917. Malcomson, Herbert Thomas; Glenorchy, Knock, Belfast.

255 1917. Mann, Capt. Edward Hamilton, M.C., R.H.A.; Junior United Service Club, Charles Street, S.W. 1.

1907. Mann, Thomas Hugh, F.Z.S.; Trulls Hatch, Rotherfield, Sussex.

1904. Manson-Bahr, Brevet-Major Philip Henry, D.S.O., M.D., M.R.C.P., R.A.M.C.; 32 Weymouth Street, W. 1.

1904. Mapleton-Bree, Harvey William, M.A.; Gable End, Allesley, Coventry.

1894. Marshall, Archibald McLean, F.Z.S.; Great Chitcombe, Brede, Sussex.

260 1894. Marshall, James McLean, F.Z.S.; Bleaton Hallet, Blairgowrie, Perthshire.

1898. Massey, Herbert; Ivy Lea, Burnage, Didsbury, Manchester.

1907. Mathews, Gregory Macalister, F.L.S., F.R.S.E., F.Z.S.; Foulis Court, Fair Oak, Hants. (*Committee.*)

1915. Maton, Eustace Bertie; Enford, Pewsey, Wilts.

1915. May, William Norman, M.D.; The White House, Sonning, Berks.

265 1883. Meade-Waldo, Edmund Gustavus Bloomfield, F.Z.S.; Hever Warren, Hever, Kent.

1912. Meiklejohn, Lt.-Colonel Ronald Forbes, D.S.O. (1st Bn. Royal Warwickshire Regt.); 147 Victoria Street, S.W. 1.

Date of Election.

1899. Meinertzhagen, Colonel Richard, D.S.O., F.Z.S. (Royal Fusiliers); 63 Bedford Gardens, Kensington, W. 8.

1886. Millais, John Guille, F.Z.S.; Compton's Brow, Horsham, Sussex.

1916. Millard, Walter Samuel, F.Z.S.; Bombay Natural History Society, 6 Apollo Street, Bombay, India.

270 1903. Mills, Canon Henry Holroyd, M.A., F.Z.S.; The Rectory, St. Stephen-in-Brannel, Grampound Road, Cornwall.

1879. Mitchell, Frederick Shaw; Hornshaws, Millstream, B.C., Canada.

1901. Mitchell, P. Chalmers, M.A., D.Sc., LL.D., F.R.S., F.L.S., F.Z.S.; Secretary to the Zoological Society of London, Regent's Park, N.W. 8.

1919. Montagu, The Right Hon. E. S.; 24 Queen Anne's Gate, S.W. 1.

1920. Moon, Dr. Harold Joseph, M.R.C.S., L.R.C.P.; 65 South Drive, St. Anne's-on-the-Sea, Lancashire.

275 1914. Moulton, Major John Coney, M.A., B.Sc., F.L.S., F.R.G.S., F.E.S.; Fort Canning, Singapore; The Hall, Bradford-on-Avon, Wilts.

1886. Muirhead, George, F.R.S.E.; Speybank, Fochabers, Morayshire.

1893. Mullens, Major William Herbert, M.A., LL.M., F.Z.S.; Westfield Place, Battle, Sussex.

1892. Munn, Philip Winchester, F.Z.S.; Stourwood Cottage, Stourwood Avenue, Southbourne, Hants.

1918. Munt, Harry Raymond; 10 Ashburn Place, South Kensington, S.W. 7.

280 1897. Munt, Henry, F.Z.S.; 10 Ashburn Place, South Kensington, S.W. 7.

1910. Murray, Capt. Herbert Willaume, F.Z.S.; The Old House, Epsom, Surrey.

1920. Musselwhite, Donald Woodward; 7 Jessica Road, Wandsworth Common, S.W. 18.

1907. Neave, Sheffield Airey, M.A., B.Sc., F.Z.S.; 24 De Vere Gardens, Kensington, W. 8.

1895. Nesham, Robert, F.Z.S., F.E.S.; Utrecht House, Poynder's Road, Clapham Park, S.W. 4.

285 1920. Nevill, Captain Thomas Nevill Carlton; Bramall Hall, Cheshire.

Date of Election.

1920. Newman, John; Oare House, Oare, Brendon, N. Devon.

1904. Newman, Thomas Henry, F.Z.S.; Newlands, Harrowdene Road, Wembley, Middlesex.

1917. Nicholl, Archibald M. C.: Royal Naval College, Osborne, Isle of Wight.

1902. Nichols, John Bruce, F.Z.S.; Parliament Mansions, Victoria Street, S.W. 1.

290 1900. Nichols, Walter Buchanan; Stour Lodge, Bradfield, Manningtree, Essex.

1876. Nicholson, Francis, F.Z.S.; Ravenscroft, Windermere, Westmoreland.

1902. Nicoll, Michael John, F.Z.S.; Valhalla House, Zoological Gardens, Giza, Egypt.

1920. O'Donel, Harry Victor; Hasimara T.E., Hasimara P.O., E.B. Railway, Duars, India.

1889. Ogle, Bertram Savile; Hill House, Steeple Aston, Oxon.

295 1907. Oldham, Charles, F.Z.S.; The Bollin, Shrublands Road, Berkhamsted, Herts.

1906. Osmaston, Bertram Beresford (Imperial Forest Service); Pachmarhi, C.P., India.

1913. Owen, John Hugh; Old School House, Felsted, Essex.

1919. Page, Wesley Theodore, F.Z.S.; Langstone, Lingfield, Surrey.

1883. Parker, Henry, C.E.; 26 St. George's Road, St. Anne's-on-the-Sea, Lancs.

300 1880. Parkin, Thomas, M.A., F.L.S., F.Z.S.; Fairseat, High Wickham, Hastings, Sussex.

1908. Paton, Edward Richmond, F.Z.S.; Hareshawmuir, By Kilmarnock, Ayrshire, Scotland.

1911. Patterson, William Harry; 25 Queen's Gate Gardens, S.W. 7.

1904. Pearse, Theed; Courtenay, British Columbia.

1894. Pearson, Charles Edward, F.L.S.; Hillcrest, Lowdham, Notts.

305 1902. Pease, Sir Alfred Edward, Bt., F.Z.S.; Pinchinthorpe House, Guisborough, Yorkshire; and Brooks's Club, St. James's Street, S.W. 1.

1891. Penrose, Francis George, M.D., F.Z.S.; Rathkeale, 51 Surrey Road, Bournemouth.

1900. Percival, Arthur Blayney, F.Z.S.; Game Ranger, Nairobi, British East Africa; Sports Club, St. James' Square, S.W. 1.

Date of Election.

1912. Pershouse, Major Stanley; c/o Messrs. Cox & Co., 16 Charing Cross, S.W. 1.

1886. Phillips, Ethelbert Lort, F.Z.S.; 79 Cadogan Square, S.W. 1.

310 1920. Phillips, Montague Austin, F.L.S., F.Z.S.; Devonshire House, Reigate, Surrey.

1920. Phillips, Captain William Watt Addison; Anasigalla, Matugama, Ceylon; and Bowden Lodge, Russell Terrace, Leamington.

1893. Pigott, Sir Thomas Digby, C.B.; The Lodge, Lower Sheringham, Norfolk.

1914. Pitman, Capt. Charles Robert Senhouse (27th Punjabis); Drewton, Chelston, Torquay.

1908. Player, W. J. Percy; Wernfadog, Clydach R.S.O., Glamorganshire.

315 1907. Pocock, Reginald Innes, F.R.S., F.L.S., F.Z.S.; Superintendent of the Zoological Gardens, Regent's Park, N.W. 8.

1917. Poliakov, Gregory T. (Editor 'Messager Ornithologique'); Moskva-Nijninovgorod Railway, Station Obiralovka, Savvino, Russia.

1905. Pollard, Lt.-Col. Arthur Erskine St. Vincent (The Border Regiment); c/o Mrs. A. Pollard, Heatherlands, Lilliput, Dorset.

1896. Popham, Hugh Leyborne, M.A.; Houndstreet House, Pensford, Somerset.

1920. Pratt, Herbert; 62 Lyford Road, Wandsworth Common, S.W. 18.

320 1898. Price, Athelstan Elder, F.Z.S.; Salisbury Hall, St. Albans.

1901. Proud, John T.; Dellwood, Bishop Auckland, Durham.

1903. Ralfe, Pilcher George; The Parade, Castletown, Isle of Man.

1903. Ratcliff, Frederick Rowlinson; 29 Connaught Square, W.2.

1917. Rattray, Col. Rullion Hare (retired); 68 Dry Hill Park Road, Tonbridge.

325 1917. Raw, William; 36 Rosemont Avenue, North Finchley.

1894. Read, Richard Henry, M.R.C.S., L.R.C.P.; Church Street, Hanley, Staffordshire.

1888. Read, Robert H.; 8 *a* South Parade, Bedford Park, W. 4.

1917. Reeve, Capt. John Sherard (Grenadier Guards), F.Z.S.; Leadenham House, near Lincoln.

Date of Election.

1903. RENAUT, WILLIAM E.; Royal Academy of Music, York Gate, Marylebone Road, N.W. 1.

330 1908. RICHARDSON, NORMAN FREDERIC, F.R.G.S.; "Lynton," Brigstock Road, Thornton Heath, Surrey.

1907. RICHMOND, HERBERT WILLIAM, M.A., F.R.S.; King's College, Cambridge.

1895. RICKETT, CHARLES BOUGHEY, F.Z.S.; 27 Kendrick Road, Reading, Berks.

1920. RINGROSE, BERNARD JOHN; Wilford Rise, Bromeswell Heath, Woodbridge, Suffold.

1896. RIPPON, Lt.-Col. GEORGE, F.Z.S.; United Service Club, Pall Mall, S.W. 1.

335 1907. RITCHIE, Captain ARCHIBALD THOMAS AYRES; c/o British East African Corps, Mombassa, B.E. Africa; and 16 Walton Street, S.W. 1.

1902. RIVIÈRE, BERNARD BERYL, F.R.C S.; St. Giles's Plain, Norwich, Norfolk.

1898. ROBINSON, HERBERT C., C.M.Z.S.; Selangor State Museum, Kuala Lumpur, Federated Malay States.

1912. ROBINSON, HERBERT WILLIAM, F.Z.S.Scot.; Patchetts, Caton, near Lancaster.

1917. ROBINSON, SYDNEY MADDOCK; c/o Col. J. H. Evans, Fraser Road, Rangoon, Burma.

340 1919. ROBINSON, THEODORE RICHARD; Brunswick Lodge, Dunton Green, Kent.

1896. ROGERS, Lt.-Col. JOHN MIDDLETON, D.S.O., F.Z.S. (late 1st Dragoons); Riverhill, Sevenoaks, Kent.

1913. ROGERS, REGINALD NANKIVELL; Carwinion, near Falmouth, Cornwall.

1893. ROTHSCHILD, LIONEL WALTER, Lord, D.Sc., Ph.D., F.R.S., F.Z.S.; Zoological Museum, Tring, Herts.

1894. ROTHSCHILD, The Hon. NATHANIEL CHARLES, M.A., F.Z.S.; Arundel House, Kensington Palace Gardens, W. 8.

345 1918. ROWAN, WILLIAM, The Dept. of Biology, University of Alberta, Edmonton, Alta, Canada.

1907. RUSSELL, Capt. CONRAD GEORGE EDWARD, F.Z.S. (Beds. Yeomanry); 2 Audley Square, W. 1.

1910. RUSSELL, HAROLD, F.Z.S.; 16 Beaufort Gardens, Chelsea, S.W. 3.

1883. ST. QUINTIN, WILLIAM HERBERT, F.Z.S.; Scampston Hall, Rillington, Yorkshire.

Date of
Election.

1903. Sandeman, Lt.-Col. Robert Preston (R. Gloucester Hussars); Dan-y Parc, Crickhowell, S. Wales.

350 1889. Sapsworth, Arnold Duer, F.Z.S.; 30 Sussex Place, Regent's Park, N.W. 1.

1902. Sargeaunt, Arthur St. George; Exbury, Padstow, Cornwall.

1914. Sauer, Dr. Hans, F.Z.S.; Bath Club, Dover Street, W. 1.

1909. Savage, The Rev. Ernest Urmson; The Vicarage, Levens, Milnthorpe, Westmoreland.

1891. Sclater, William Lutley, M.A., F.Z.S. 10 Sloane Court, Chelsea, S.W. 1. (*Editor.*)

355 1908. Seppings, Lt.-Col. John William Hamilton, A.P.D.; The Castle, Cape Town, South Africa.

1899. Serle, The Rev. William, M.A., B.D.; The Manse, Duddingston, Edinburgh.

1901. Seth-Smith, David, F.Z.S.; 34 Elsworthy Road, South Hampstead, N.W. 3.

1904. Seth-Smith, Leslie Moffat, B.A., F.Z.S.; Tangley, Caterham Valley, Surrey; and Kampala, Uganda.

1909. Seton, Sir Malcolm Cotter Cariston, K.C.B.; 13 Clarendon Road, Holland Park, W. 11; and Union Club, Trafalgar Square, S.W. 1.

360 1865. Shepherd, The Rev. Charles William, M.A., F.Z.S.; Trottiscliffe Rectory, Maidstone, Kent.

1917. Shipton, William, B.A., M.D.; 2 The Square, Buxton, Derbyshire.

1920. Skea, Ernest Marcellus; Chief Assayer of Gold Mining States, Ltd., P.O. Box, 46 Pilgrims Rest, Transvaal.

1918. Sladen, Major Alexander George Lambart; Kingswood House, The Lee, Bucks; and Junior Carlton Club, S.W. 1.

1908. Smalley, Frederic William, F.Z.S.; Windermere, 4 Blackheath Park, S.E. 3.

365 1918. Smeed, Major Cecil William, R.F.A.; Miland, Westbourne, West Sussex.

1920. Smith, Desmond Abel; Longhills, near Lincoln.

1914. Smith, Major John Lindsay (Indian Army); Supply & Transport Corps, Commdt. Camel Corps, Multan, Punjab, India.

Date of Election.

1918. Smith, Thomas; Whiston Eaves, Froghall, Stoke-on-Trent.

1906. Snouckaert van Schauburg, Baron René Charles; Doorn, Holland.

370 1903. Sparrow, Colonel Richard, C.M.G., D.S.O., F.Z.S., F.R.G.S. (late 7th Dragoon Guards); Rookwoods, Sible Hedingham, Essex.

1906. Stanford, Surgeon-Commdr. Charles Edward Cortis, B.Sc., M.B., R.N.; 94 Jermyn Street, S.W. 1.

1910. Stanford, Edward Fraser; 12 a Maddox Street, Regent Street, W. 1.

1913. Stanford, Major Henry Morrant, M.C., R.F.A., 115 Battery, B.E.F., France; c/o Messrs. Edward Stanford, Ltd., 12–14 Long Acre, W.C. 2.

1913. Stanford, Capt. John Keith, M.C.; c/o Messrs. Edward Stanford, Ltd., 12–14 Long Acre, W.C. 2.

375 1915. Staples-Browne, Capt. Richard Charles, B.A., F.Z.S. (New Zealand Med. Corps); Brashfield House, Bicester, Oxon.

1900. Stares, John William Chester; Portchester, Hants.

1902. Stenhouse, Surgeon-Capt. John Hutton, M.B., R.N.

1910. Stevens, Herbert; Gopaldhara, Mirik P.O., Kurseong, Darjiling Himalayan Rly., India.

1906. Steward, Edward Simmons, F.R.C.S.; 30 Victoria Avenue, Harrogate, Yorks.

380 1914. Stewart, John; Mainshill, Beith, Ayrshire.

1917. Stoneham, Capt. Hugh Frederic, O.B.E., F.E.S., 1st Battn. East Surrey Regt. & Asst. Chief Signal Officer, Northern Command; "Stoneleigh," Reigate, Surrey; and Army & Navy Club, Pall Mall, S.W. 1.

1881. Studdy, Col. Robert Wright (late Manchester Regiment); Westbury, Paignton, Devon.

1918. Sturge, Arthur Lloyd; Shepherd's Green, Chislehurst, Kent.

1887. Styan, Frederick William, F.Z.S.; Stone Street, near Sevenoaks, Kent.

385 1914. Sutherland, Lewis Robertson, M.B., C.M., Medical School, Dundee, N.B.; Wellgate House, West Newport, Fifeshire.

1907. Swann, Lt. Geoffrey, R.A.S.C.; 6 Moorgate Street, E.C. 2.

1905. Swann, Harold, F.Z.S.; 9 Evelyn Gardens, S.W. 7.

Date of Election.

1920. Swann, Harry Kirke, F.Z.S.; Thorncombe, Lyonsdown Road, New Barnet, Herts.

1882. Swinhoe, Col. Charles, M.A., F.L.S., F.Z.S.; 4 Gunterstone Road, West Kensington, W. 14.

390 1884. Tait, William Chaster, F.Z.S.; Entre Quintas 155, Oporto, Portugal.

1911. Talbot-Ponsonby, Charles George; 5 Crown Office Row, Temple, E.C. 4.

1911. Tatton, Reginald Arthur; Cuerden Hall, Bamber Bridge, Preston, Lancs.

1914. Tavistock, Hastings William Sackville, Marquis of, F.Z.S.; Warblington House, Havant.

1905. Taylor, Lionel Edward, F.Z.S.; Bankhead, Kelowna, British Columbia.

395 1886. Terry, Major Horace A. (late Oxfordshire Light Infantry); Compton Grange, Compton, Guildford, Surrey.

1916. Thomasset Bernard Charles, F.Z.S.; The Manor House, Ashmansworth, near Newbury, Berks.

1904. Thompson, Major William R., R.G.A.; Belvedere, Guernsey, Channel Islands.

1911. Thomson, A. Landsborough, M.A.; Castleton House, Old Aberdeen, Scotland.

1900. Thorburn, Archibald, F.Z.S.; Hascombe, Godalming, Surrey.

400 1920. Thornhill, Lt.-Colonel Cudbert John Massy, C.M.G., D.S.O., Indian Army, Bath Club, Dover Street, W. 1.

1893. Thorpe, Dixon L.; Loshville, Etterby Scaur, Carlisle, Cumberland.

1903. Ticehurst, Claud Buchanan, M.A., M.D., M.R.C.S.; 146 London Road North, Lowestoft.

1894. Ticehurst, Norman Frederic, M.A., M.B., F.R.C.S., F.Z.S.; 24 Pevensey Road, St. Leonards-on-Sea, Sussex.

1902. Townsend, Reginald Gilliat, M.A.; Buckholt, West Tytherley, Salisbury, Wilts.

405 1893. Trevor-Battye, Aubyn, M.A., F.L.S., F.Z.S.; Ashford Chace, Petersfield, Hants: and Royal Societies Club, St. James's Street, S.W. 1.

1913. Tuckwell, Edward Henry, F.Z.S.; Berthope, Compton, near Guildford, Surrey.

Date of Election.

1911. Tyrwhitt-Drake, Hugh Garrard, F.Z.S.; Cobtree, Sandling, Maidstone, Kent.

1864. Upcher, Henry Morris, F.Z.S.; Sheringham Hall, Cromer, Norfolk.

1918. Vaizey, George de Horne; 53 The Pryors, Hampstead, N.W. 3.

410 1918. Vaizey, Ker George Russell; 26 Cornwall Gardens, S.W. 7.

1910. Van Someren, Dr. Robert Abraham Logan; Jinja, Uganda, British East Africa.

1912. Van Someren, Dr. Victor Gurnet Logan; c/o Medical Dept., P.O. Box 140, Nairobi, B.E. Africa.

1908. Vaughan, Matthew; The Limes, Marlborough, Wilts.

1906. Vaughan, Commdr. Robert E., R.N.; Whittington Lodge, Worcester.

415 1913. Venning, Capt. Francis Esmond Wingate; c/o O.C. Depot, 31st Punjabis, Rawalpindi, India.

1881. Verner, Col. William Willoughby Cole (late Rifle Brigade); Hartford Bridge, Winchfield, Hants: and United Service Club, S.W. 1.

1902. Wade, Edward Walter; Melton Road, North Ferriby, East Yorks.

1886. Wade-Dalton, Col. H. D.; Hauxwell Hall, Finghall R.S.O., Yorkshire.

1916. Wait, Walter Ernest, Deputy Collector of Customs, Colombo, Ceylon.

420 1918. Walker, Alexander Hope, M.D., L.R.C.P., M.R.C.S.; The Common, Cranleigh, Surrey.

1914. Wall-Row, John; 51 Courtfield Gardens, S.W. 5.

1895. Wallis, Henry Marriage; Ashton Lodge, Christchurch Road, Reading, Berks.

1899. Walton, Lt.-Col. Herbert James, M.D., F.R.C.S., C.M.Z.S., I.M.S.; c/o Messrs. King, King & Co., P.O. Box No. 110, Bombay, India.

1920. Ward, Major Edward Hugh; R.M.A.; H.M. Wireless Station, Aden.

425 1872. Wardlaw-Ramsay, Col. Robert George, F.Z.S.; Whitehill, Rosewell, Midlothian.

1903. Watt, Hugh Boyd, F.Z.S.; 12 Great James Street, Bedford Row, W.C. 1.

Date of Election.

1920. Waydelin, Frederick John; Haverhill, Whitchurch, Hants.

1920. Webber, Captain William Beare Incledon; Buckland House, Branton, N. Devon.

1912. Wells, Charles Henry; Broomfield, 80 Brookhouse Hill, Fulwood, Sheffield.

430 1919. Wemyss-Charteris, The Hon. Guy Lawrence; 26 Catherine Street, Buckingham Palace Road, S.W. 1.

1912. Wenner, Max Victor; Lake House, Sutton, near Macclesfield, Cheshire.

1913. Whistler, Hugh, F.Z.S. (Indian Police); Caldbee House, Battle, Sussex; and c/o Messrs. King, King & Co., Bombay, India.

1918. Whitaker, Capt. John Albert Charles (Coldstream Guards); Babworth Hall, Retford, Notts.

1891. Whitaker, Joseph I. S., F.Z.S.; Malfitano, Palermo, Sicily.

435 1909. White, Henry Luke; Belltrees, Scone, New South Wales, Australia.

1903. White, Stephen Joseph, F.Z.S.

1912. Whymper, Samuel Leigh; Oxford Mansions, Oxford Street, W. 1; and Oriental Club, Hanover Square, W. 1.

1914. Wickham, Percy Frederic; c/o Messrs. Thos. Cook & Son, Rangoon, Burma.

1915. Wild, Oliver Hilton; Ariel Lodge, Cheltenham, Gloucestershire.

440 1894. Wilkinson, Johnson; Vermont, Huddersfield, Yorkshire.

1912. Wilkinson, William Arthur, F.L.S., F.Z.S.; Lindum House, Anchorage Road, Sutton Coldfield, nr. Birmingham.

1916. Williamson, Walter James Franklin, C.M.G., F.Z.S. (Financial Adviser to the Government of Siam); Bangkok, Siam.

1920. Wilson, Commander Alec Thomas Lee, J.P., R.N.; Garth House, Garth, Breconshire.

1897. Wilson, Allan Read, B.A., M.D., B.Ch. (Oxon.); Eagle House, Blandford, Dorset.

445 1888. Wilson, Charles Joseph, F.Z.S.; 14 Suffolk Street, Pall Mall, S.W. 1.

1897. Witherby, Harry Forbes, M.B.E., F.Z.S.; 12 Chesterfield Gardens, Hampstead, N.W. 3.

Date of Election.

1908. Witherington, Gwynne; 19 Sumner Place, South Kensington, S.W. 7.

1899. Wollaston, Alexander Frederick Richmond, B.A.; 20 Moore Street, S.W. 3.

1912. Wood, Martin Stanley, M.D., R.A.M.C.; Cheadle Royal, Cheadle, Cheshire.

450 1917. Woodford, Capt. Charles Edward Montgomerie (1st Battn. Sherwood Foresters); 8 Dry Hill Park Road, Tonbridge, Kent.

1912. Woodhouse, Cecil, M.D.; Coaxdon Hall, Axminster, South Devon.

1902. Workman, William Hughes, F.Z.S.; Lismore, Windsor, Belfast, Ireland.

1912. Wormald, Hugh; Heathfield, Dereham, Norfolk.

1908. Wynne, Richard Owen; Foulis Court, Fair Oak, Hants.

455 1895. Yerbury, Lt.-Col. John William (late R.A.), F.Z.S.; 2 Ryder Street, St. James's, S.W. 1; and Army and Navy Club, S.W. 1.

1916. Zambra, Rag. Cav. Vittorio; Corso Umberto, I. 49, Rome, Italy.

Extra-Ordinary Member.

1899. Godwin-Austen, Lt.-Col. Henry Haversham, F.R.S., F.Z.S.; Nore, Hascombe, Godalming, Surrey.

Honorary Members.

1907. Allen, Joel Asaph, Ph.D., F.M.Z.S.; American Museum of Natural History, Central Park, New York, U.S.A.

1914. Bianchi, Dr. Valentine; Imperial Zoological Museum, Petrograd, Russia.

1917. Chapman, Frank Michler; American Museum of Natural History, Central Park, New York, U.S.A.

1919. Menegaux, Henri August; Muséum d'Histoire Naturelle, Paris.

5 1905. Oberholser, Harry Church; United States National Museum, Washington, D.C., U.S.A.

1915. Richmond, Charles Wallace; United States National Museum, Washington, D.C., U.S.A.

1903. Ridgway, Robert, C.M.Z.S.; Smithsonian Institution, Washington, D.C., U.S.A.

Date of Election.

1890. Salvadori, Count Tommaso, M.D., F.M.Z.S.; Royal Zoological Museum, Turin, Italy.

1919. Stejneger, Leonhard, C.M.Z.S.; Smithsonian Institution, Washington, D.C., U.S.A.

Honorary Lady Members.

1910. Bate, Miss Dorothea M. A.; Bassendean House, Gordon, Berwickshire.

1911. Baxter, Miss Evelyn Vida; The Grove, Kirkton of Largo, Fifeshire.

1910. Bedford, Mary, Duchess of, F.Z.S.; Woburn Abbey, Beds.

1916. Haviland, Miss Maud D.; Old Hall, Newnham College, Cambridge.

5 1915. Jackson, Miss Annie C.; Swordale, Evanton, Ross-shire.

1911. Rintoul, Miss Leonora Jeffrey; Lahill, Largo, Fifeshire.

1915. Snethlage, Dr. Emilie; Goeldi Museum, Pará, Brazil.

1910. Turner, Miss Emma Louisa, F.Z.S.; Langton Close, Girton, Cambridge.

Colonial Members.

1904. Campbell, Archibald James; Bulgaroo, Broughton Road, Surrey Hills, Victoria, Australia.

1908. Farquhar, John Henry Joseph, B.Sc., N.D.A.; Assistant Conservator of Forests, Calabar, Southern Nigeria, West Africa.

1910. Fleming, James H., C.M.Z.S.; 267 Rusholme Road, Toronto, Canada.

1909. Haagner, Alwin Karl, F.Z.S.; Director of the Zoological Gardens, Box 754, Pretoria, South Africa.

5 1908. Hall, Robert, F.L.S., C.M.Z.S.; c/o Tasmanian Museum, Hobart, Tasmania.

1914. Leach, John Albert, M.A., D.Sc.; c/o Education Department, Melbourne, Australia.

1905. Macoun, John, M.A., F.R.S.C.; Naturalist to the Geological Survey of Canada, Ottawa, Canada.

1907. Swynnerton, Charles Francis Massy, F.L.S.; Poste Restante, Dar-es-Salaam, German East Africa.

Date of
Election.

1919. Taverner, Percy A.; Victoria Memorial Museum, Ottawa, Canada.

10 1912. White, Capt. Samuel Albert; Wetunga, Fulham, South Australia.

Foreign Members.

1909. Alphéraky, Sergius N.; Academy of Science, Petrograd, Russia.

1919. Bangs, Outram; Museum of Comparative Zoölogy, Cambridge, Mass., U.S.A.

1880. Bureau, Dr. Louis; École de Médecine, Nantes, France.

1906. Büttikofer, Dr. Johannes, C.M.Z.S.; Director of the Zoological Garden, Rotterdam, Holland.

5 1906. Buturlin, Sergius A.; Wesenberg, Esthonia, Russia.

1919. Dabbene, Dr. Roberto; Museo Nacional, Buenos Aires, Argentina.

1919. Grinnell, Dr. Joseph; Museum of Vertebrate Zoology, Berkeley, California, U.S.A.

1919. Gyldenstolpe, Count Nils; Royal Zoological Museum, Stockholm, Sweden.

1902. Ihering, Dr. Herman von, C.M.Z.S.; Director, State Museum of Catarina, Florianopolis, Brazil.

1918. Kuroda, Nagamachi; Fukuyoshi Cho, Akasaka, Tokyo, Japan.

10 1914. Lönnberg, Prof. Dr. A. J. Einar, F.M.Z.S.; Director of the Zoological Museum, Stockholm, Sweden.

1894. Menzbier, Prof. Dr. Michael, C.M.Z.S.; University for Women, Devitchje, Pola, Moscow, Russia.

1914. Stone, Dr. Witmer; Academy of Natural Sciences, Philadelphia, Pa., U.S.A.

1902. Sushkin, Dr. Peter, C.M.Z.S.; Zootomical Cabinet and Museum, The University, Kharkov, Russia.

15 1917. Van Oort, Dr. Eduard Daniel; Museum of Natural History, Leyden, Holland.

1896. Winge, Herluf, C.M.Z.S.; University Zoological Museum, Copenhagen, Denmark.

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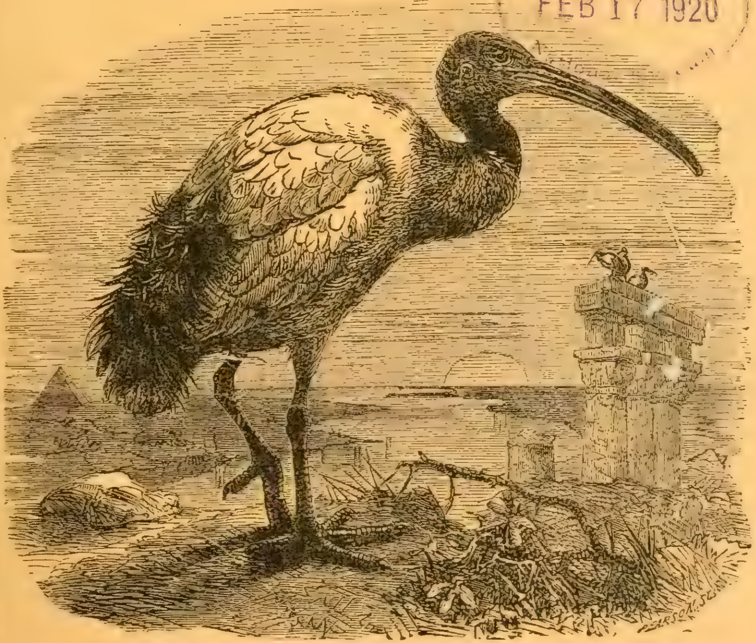

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I.—*Further Ornithological Notes from the Neighbourhood of Cape San Antonio, Province of Buenos Ayres.* Part III. Phœnicopteridæ—Rheidæ. By Ernest Gibson, M.B.O.U., F.Z.S.*

333. **Phœnicopterus ignipalliatus** Geoffr. et d'Orb. Argentine Flamingo.

Supplementing my former meagre notes on the Argentine Flamingo, I can only confirm the fact that the bird is resident in our district, and stationary, so far as I can judge. For the probable reason of this, Hudson's suggestion may be accepted, namely, the milder climatic conditions of a region bordering on the sea-coast. Be that as it may, I find this species as frequently noted in my diary during the winter season as the summer, and *vice versa*, whilst young birds in the grey plumage are equally general. Our salt water or brackish lagunas of the Palenque, Milan, Pasaje, etc., are its usual haunts; and I have actually ridden past (at a distance of twenty yards) three young Flamingos which were feeding in a wide cangrejal in an open part of the town of Ajó. Occasionally, but very rarely, I have seen from one to three or five birds at some freshwater laguna or pond of our inland marshes; but these are most exceptional cases. Though they are never persecuted here, I have found flocks on the whole to be very wary, remaining well out of gun-shot.

---

* Concluded from 'Ibis,' 1919, p. 537.

I am still ignorant of the nesting-habits of the species. The Palenque laguna might serve the purpose of breeding, but I would surely have heard of the event if such had been the case. The "Saladas"—some large brackish lagunas fifteen leagues to the south—would, I imagine, be a suitable locality; and I have been actually told that it nests at the Chascomus laguna, a considerable distance to the south of Buenos Ayres, but I cannot vouch for the truth of the rumour.

More than once I have partaken of roast Flamingo. A fat bird is as excellent eating as a good domestic goose, and is even richer in flavour. One peculiarity it presents when cooked is the extraordinary colour of the flesh—a bright orange-red; and this, for some curious reason, caused me a decided repugnance at the time. I say "curious" advisedly, for, from necessity or choice, I have repeatedly partaken of such unusual viands as horse-flesh (not the broken-down hack be it said, but the unhandled mare or colt), Rhea or South American Ostrich, Patagonian Hare, Biscacho, Nutria, and various Armadillos, to say nothing of such small deer as frogs and snails, all without any of the shrinking which the gaudily-hued Flamingo dish produced. It smelt good, and tasted better; but it looked as if red-hot from the Devil's kitchen!

334. **Chauna chavaria** Linn. Crested Screamer.

Adult. Iris dark brown; orbits and cere dull magenta; bill slate-colour; legs and feet bright magenta.

The "Chajá" (phonetically "Chahá") has been so fully described by Hudson and myself ('Argentine Ornithology,' and 'The Ibis,' 1880, p. 165) that there only remains to cull certain excerpts from the voluminous entries in my diary, or amplify former observations.

This "majestic bird," to quote Hudson's designation, is not only my familiar friend of the wild and wide Pampas, but has recalled itself to my attention in the most unexpected situations. One bright spring morning I was lounging with a friend in the grounds of the Agricultural Show at Buenos Ayres, awaiting the resumption by the judges of their task.

We were presently joined by young B., who casually remarked, "Look at the height of these Chajás up in the sky" (Chajás over a city of a million and a half inhabitants!). E. and I looked at each other and up to the zenith at the indicated specks, and then the former commented, sadly, "B., my friend, certain unjust and corrupt judges have awarded you and your worthy father, in the course of the last two days (and utterly regardless of my superior claims), many and great silver cups. It is to be feared that you have hallowed these last night to more than the orthodox extent. The birds you see are not Chajás, but the first of the spring swallows." At that moment there came faintly down to our ears the well-known notes, "Chajá, Chajá-lí," of the birds in question! E. pulled himself up, angrily, and turned to me, "What is the meaning of that, Gibson? We are not in the Camp." "No," I replied, laughingly, "but now I come to think of it, the Zoological Gardens are just across the way, and I remember having seen various Chajás amongst the birds in a state of freedom about the lawns; nevertheless, it had not occurred to me that they were unpinioned and might soar at their own sweet will." Similarly, one hot July day in the London Zoo, I was startled from a reverie, my thoughts far away in the Camp, by the sonorous cry from a neighbouring enclosure. Again, going through the Cambridge Museum recently, my attention was called to a case of birds in connection with which my name figured; and I was amused to find they were a series of two Chajás with their young, which I had furnished "by request" of a mutual friend many years ago, and quite forgotten.

The tameness of the Chajá has been alluded to by Mr. Hudson, and I can readily credit his statement that in former years he "had often ridden through large scattered flocks without making the birds take wing." The same thing has occurred to me when travelling by the "galera," or stage-coach, between Ajó and Dolores; only those birds more directly in our way taking reluctantly to flight for a short distance, though sometimes there would be an undignified scurry and beating of great wings if the leading postilion suddenly swerved owing to the exigencies of the track. Flocks of birds are very local in their habits when resting at certain periods of the day, and one such, composed of some forty individuals, near the Yngleses head-station, used barely to keep clear of the general traffic, and would be found about the same place every day for months at a time. Of a pair which I passed one day at a pond in the woods, and which saw me approaching, one rose at a normal distance of perhaps a hundred yards; the other not until I was within five yards of it, when it leisurely took to flight on my left, the volume of air from its powerful wings being strongly perceptible and causing my otherwise-unconcerned horse to prick its ears interrogatively. On another occasion, riding sharply round a bend in a swamp, I came across a pair standing in a shallow pool; taken by surprise they rose, wheeled suddenly towards each other, and came into collision at a height of about twenty feet, the shock causing one to land in the water again, where it remained for a moment or two looking decidedly bewildered. An unusual incident was that of a single Chajá ponderously flying after an evil-looking Carancho (*Polyborus tharus* Mol.), which it drove off and then returned to the starting-place, where I surmise its young were.

These birds are easily domesticated (again as mentioned by Hudson), and I used to see them occasionally at the puestos or substations, where I was told they served the double purpose of protecting the poultry from birds of prey (?), and that of watch-dogs, raising an alarm on the approach of strangers. In the summer of 1901–2, I again brought three young birds to the Yngleses head-station, where they became very tame. On attaining the power of flight their habit was to absent themselves during the day, returning at sundown, their favourite roosting-place being the flat tops of sundry orange-trees in my garden, which I had ultimately to protect by various bamboos with sharpened points. One evening I hurried out of the office to welcome some visitors arriving by special "galera" from Dolores; and as the ponderous vehicle with its eight horses swung into position in the patio, I was just in time to see the leading postilion nearly swept from his saddle by a low-flying Chajá entering from the southern approach—man and bird were equally startled by the encounter, only avoided by the latter swerving upwards and the former ducking to his horse's neck; whilst the alert stage-conductor (perched high on his driving-seat) shouted, laughingly, "Don't be alarmed, man, it's only some of Don Ernesto's jokes!" The birds alluded to suddenly developed their full cry at the beginning of February without my having heard any preliminary attempts; they also occasionally at night gave utterance to a muffled bark-like note. The trio emancipated themselves for good in the spring of 1903.

The rare habit of perching, which I mentioned in my former paper, has seldom been observed during these forty years. The roosting-place of the above tame birds is one instance; and to the presence of these in the garden I attribute the fact that on one occasion five others alighted on the top of an adjacent lofty eucalyptus tree, where they maintained their position with considerable difficulty. I also saw one balanced on an iron landmark, whilst its mate sat close by on the post of a fence. Lastly, on putting up a flock of some forty from the mainland in 1913, one-half of them arrested their flight across the waste of waters to perch on the posts of a nearly submerged fence.

The four years' drought of 1908–11 had necessarily a very serious effect upon this species and very few remained in the district, whilst they became so emaciated and weak that I was told it had been possible by riding up rapidly and dismounting to seize them before they could get under weigh. I am glad to say that with the occurrence of the subsequent flood and normal seasons they reappeared again in their former numbers. So late as 25 October, 1915, I chronicled two fine flocks of about one hundred and fifty respectively, "on localities characterised by an abundance of young grass, white clover, and another trefoil."

There are two reasons why the Chajá is not persecuted as an article of food (for the flesh is excellent). "Tiene mucha espuma," "it has much froth," is the Gaucho's disgusted comment. This is in reference to the innumerable air-cells existent between the skin and the flesh. Secondly, the Argentines are essentially meat-eaters, *i. e.*, beef or mutton (preferably the former, and I have heard the expression used "Él que come carnero, piensa carnero," "He who eats mutton thinks like a sheep"), game of any kind being regarded with indifference. Long may these prejudices continue to the benefit and preservation of the Chajá!

The nesting-habits have been fully described in my former paper, so I will confine myself to the following digression: "Hacer nido de Chajá," "to make a Chajá's nest," is the expression used when a deep pass in a swamp has to be negotiated, and signifies the preparatory precaution of folding or doubling-up the component rugs, etc., of the Argentine "recado," or saddle, in such a way as to gain an additional height of six or eight inches. Perched up on this, with his knees raised nearly to his chin, the rider pushes forward, steering between the clumps of rushes and watching the water gradually rise till it meets over the horse's withers and streams along just below his seat, anxiously calculating the while if the pass is only to prove "bola á pie," or if it is to be a swimming matter, when the water will rush up to his waist, and in front there will only be visible the snorting head of his horse and a span of its neck.

As regards the number of eggs, I must differ from both Hudson and Claude Grant. The full clutch is as often six as five, and I have known two of seven each. By the way, the eggs are excellent eating. Average measurements 87 × 58 mm.

Chloëphaga rubidiceps Scl. P. Z. S. 1860, p. 415, pl. clxxiii.

This, and the following species—*Chloëphaga poliocephala* Gray—are chronicled by Claude Grant from Ajó ('The Ibis,' 1911, p. 343). Neither have come under my particular notice (nor have I known by hearsay of any such previous occurrence during all my residence in the district), and I therefore take the opportunity of transcribing Claude Grant's remarks: "This Goose (*C. rubidiceps*) had not been seen in the Ajó district for many years until the winter of 1909. A good many made their appearance in the middle of May, and several hundreds had arrived before I left in the middle of June. I was afterwards informed by Miss Runnacles 'that in company with *Chloëphaga poliocephala* they came in their thousands and literally covered the camp, being most unwelcome visitors, as the drought had caused a scarcity of grass and these flocks of Geese had helped to eat what was left; they began to thin out towards the end of July and by the middle of August hardly one remained.'" It was my misfortune to be absent from the locality in this interesting year.

337. **Bernicla poliocephala** Gray. Ashy-headed Goose.

See former notes under the name of *Chloëphaga poliocephala*.

338. **Cygnus nigricollis** Gm. Black-necked Swan.

The habits of the Black-necked Swan were very fully dealt with in my former paper, and consequently I have but few remarks to offer at present.

From my diary I gather one instance where a peon rode down and secured an individual in shallow water as illustrative of the difficulty these heavy birds have in rising—flapping along the surface for a considerable distance.

Another entry refers to a shooting incident at the Laguna Milan: Standing in the laguna near some rushes a pair of Swans came over me from behind, one of which I shot. Immediately following the report of the gun and the resounding splash of the great bird, the shallow water all round me was broken by innumerable furrows running in every direction. Recovering from my surprise, I emptied the second barrel at one of these and killed a large "Liza," or Grey Mullet! It would appear that a shoal of these fish had come up one of the cangrejales (as they frequently do with the tide) and were basking in the brackish shallows of the laguna. I subsequently shot one other, after many failures, but without the satisfaction attached to the first. Indeed, a wild Swan with the right-hand barrel and a Grey Mullet with the choke, as a "right-and-left," reads somewhat like a shooting and fishing yarn combined.

The species continues to be as abundant as ever in this district and its vicinity; on the 19th of March, 1914, I saw a flock of some hundreds on the Saladas laguna, fifteen leagues to the south. It is little persecuted, the local value of the skin (my date is of 1899) being only 25 cents., or 5*d.* Thirty or forty years ago I used frequently to hear the familiar whistling note as pairs or flocks passed over the city of Buenos Ayres at night; now they evidently give that great capital, so glaring and full of light, a very wide berth.

The breeding-habits have been described at length ('Ibis,' 1880, p. 35). I may add, since then, that two nests taken on the 1st of July, 1899, are dated practically in the middle of winter; while one of the 24th of March, 1914 (with four incubated eggs), is very late in the autumn. I also record another clutch of six eggs, the second instance, the usual number being five or four. On the same date (21 November, 1913) on which I took this nest of six fresh eggs my diary has the following entry: "As the raft (horse-drawn pontoon) emerged from a deep belt of juncos we came across a pair of Swans with three half-grown cygnets. The two old birds swam rapidly away from the open water where we had surprised them with the young in line between them, the female (as I take it) leading. When about to gain the shelter of the rushes in the deep cañadon, the male returned alone and proceeded to lead in front of the raft for a considerable distance; then it rose and flew forward, finally settling on the water a long way ahead." From the foregoing it will be seen that the nesting-season is very irregular.

Average measurement of eggs 106 × 66 mm.

339. **Coscoroba candida** Vieill. Coscoroba Swan.

(As will be seen further on, I am led to modify and amplify my former notes on the nesting-habits of this species, *vide* 'The Ibis,' 1880, p. 36.)

Mr. Hudson, in dealing with the beauty and other characteristics of the Coscoroba Swan, places it second to its Black-necked congener, *Cygnus nigricollis*; whilst I still adhere to my expressed opinion that *Coscoroba candida* is the handsomer, and in many respects more interesting, bird. The superior size and greater numerical predominance of the one necessarily establish a certain priority ; on the other hand, the latter is the more graceful (in spite of a shorter neck) and shows a certain bold defiance as it swims backwards and forwards, challenging the intruder and answering its mate, before taking to flight, whilst *C. nigricollis* flaps heavily away over the water or remains timidly and in silence in the offing. As Hudson admits, the flight is also freer, and I have often noticed that it detects the hidden gunner and deflects its course in accordance much more readily than the heavier black-necked species. I would note that in 'Argentine Ornithology' the beautiful illustration pertaining to *C. nigricollis* errs in depicting the individual (on the water) with a curved neck and raised back and wings. The correct portraiture of a stiff neck and straight back would obviously deprive it of these fictitious advantages; and it is *C. candida* which actually possesses and displays these attributes, accentuating them by a further graceful movement of the neck as the warning trumpet-call is uttered.

I would hesitate to say that it occasionally feeds away from the water, *i. e.*, on the grass-land. Though it may frequently be found on very shallow open marshes, its congener, *C. nigricollis,* almost entirely affects the lagunas or such deeper portions of the swamps where the use of its natatory powers is incumbent.

Only twice have I seen flocks which reached the number of fifty or sixty. But at all periods of the year pairs may be numerous, and some occasional flocks of a dozen to twenty. I am quite unable to deduce from my diary any rules regarding the migration of the species, or the motives which regulate its abundance or scarcity in the district in varying years.

The expression "Wild Swan" generally evokes the image of a bird utterly foreign to the haunts of men, essentially fearful of human beings and their dwelling-places. Accordingly any variation of this rule produces rather a startling effect upon the observer, if we take into consideration the size and striking appearance of these magnificent birds. It is for this reason that I find myself noting, one summer's morning in 1914, the following: "Was much struck by seeing from my dressing-room window on the upper floor, at early dawn, a fine flock of seven Coscoroba Swans, which came from the direction of the polo-ground, flying so low and straight that they seemed to be coming straight for me, only rising over the eucalyptus trees at the last moment and swerving behind the house." Occasionally a pair of the Black-necked Swans will pass directly over the head-station (the species being much less easily diverted from its course), and I was told of one case when, as luck would have it, a first-class shot (Mr. M. A. Runnacles, manager of Linconia) was walking up after a big day's shoot from the general dwelling-house to my private one, and had time to throw in a cartridge and bring a Swan thudding down on to the garden path.

I now come to the matter of the nesting-habits of *C. candida,* which, from my extended notes, present it under three different manifestations. The first is when the nest is in a deep swamp, and similar in position and structure to that of *C. nigricollis,* sometimes without any lining at all (when the eggs are few), otherwise with enough down and feathers to partially or wholly cover the clutch. Of five such cases the most characteristic are the two following: "4 October, 1885. Clutch of six. Nest situated in a low and sparse belt of carices, on a wide and lonely cangrejal below the Laguna del Passage. Built of dry or decayed carices to the height of twelve to eighteen inches above the water. Eggs completely covered over and hidden by small fragments of said carices, with down and feathers of the parent-birds, arranged with one in the centre surrounded by the other five. Both birds in vicinity swimming uneasily about, but not giving vent to the usual alarm note." "21 November, 1913. Clutch of seven. Nest at edge of open water in centre of deep juncal. Built of dry junco stems with some lining of down. Eight inches high, thirty across at base, and sixteen at top; quite a slight structure on the whole. Parent birds seen near; silent."

The next type is that described in my former paper ('The Ibis,' 1880, p. 37) as placed on marshy land in the vicinity of lagunas or swamps. To which may be added analogous sites hereafter detailed. Since the year 1880 my personal records of these are seven: from which I quote the following examples:—"29 June, 1889. Clutch of seven. Nest situated on a low muddy island at the Laguna Milan, where it was invisible from the mainland on account of a fringe of tall juncos. Composed of a large solid heap of dry grasses; with a hollow on the top, partially lined with white down. Birds seen. A second similar nest, also with seven eggs, and situated about a hundred yards away, had the owners in attendance. A third (unfinished) nest lay between these two." "15 October, 1913. Clutch of *eight*. Nest situated on dry ground amidst a dense covert of juncillo negro, in a most lonely locality close up against the Cañada Cisñeros. Built of dry junco stems, gathered from the swamp; lined with fine dry grasses. Note, this nest was not taken by myself, but by a trustworthy informant." The next narrative is dated 3 November, as follows:—"Locality, a grassy island, some two hundred by one hundred yards, situated in great expanse of comparatively shallow open water (the result of the flood), and surrounded by great cañadas. The adjoining shoals and mud-flats were alive with myriads of Waders of many species, Coots, and Waterhens, as we passed along with the raft and canoes to shear a flock *in situ*—the great flood being at its acme. The leading horsemen would diverge every now and then to enable our crews to lean over and scoop out the eggs from the many nests of water-fowl; and altogether the voyage had more the aspect of a picturesque picnic in the brilliant early morning, than a matter-of-fact business undertaking. Indeed, I myself mentally dismissed the latter part, whilst I contemplated the wonderful scene of bird-life extending as far as one could see on the water and in the air. It was on hearing one of the men exclaim 'There goes a Swan from its nest,' that I looked in the direction indicated and saw first one bird, then a second and then a third—for there were no less than three nests—rise and walk slowly away until they took to the water, their snowy plumage contrasting admirably with the rich green of the grass and the deep blue of the sky-reflecting water. Accordingly, after seeing all the men and impedimenta disembarked at our destination, and the work organised, I left the manager to his arduous and monotonous task; and annexing a canoe and the services of the trusty Pedro Almeira (best of Gauchos and now converted into a gondolier), poled back to inspect matters on this interesting island. The first nest was situated amidst grass of about six inches growth; built of dry junco, and having the rather cup-shaped cavity lined with down and a little dry grass; the height was about six inches, diameter at base some two feet, and of the cavity or hollow ten inches. It contained seven much-incubated eggs. The middle nest, forty yards from the preceding, was in a stronger clump of green grass a foot high, which hid it from view until I was almost on it. Consisted only of a flattened hollow in the said grass, forming a shallow cup about twenty inches in diameter, lined with down and dry grass. It was beaten down on one side, where—on the grass outside of nest—were huddled up four young, newly out of the shell. These, of a delicate pale grey colour and exceedingly dainty in appearance, took no notice of me, but continued to play with each other, or affected to nibble at the grass when I touched or stroked them, and were mute. Third nest ten yards from last, but in open space and with shorter grass again. Unlike the first nest, no junco entered into its composition; only very fine small dry grass and rootlets, forming a mound thirty inches in diameter at the base, the cup-shaped cavity being about a foot across and lined with much down. The fine and maximum clutch of *nine* eggs was much incubated. With the exception of the down-lining, it will be noticed that these three nests differ in materials and structure, though the choice and conditions were identical for all the birds. From each nest two or three paths led through the grass to the water fifty yards away, the nests being in the centre, and highest part, of the island. The parent birds kept at a distance of three or four hundred yards, swimming about and occasionally uttering their alarm-cry."

Lastly comes the class of nest which I may designate as the "truncated cone" formation; which is exemplified in the following account of a colony of no less than seventeen pairs of Swans:—The winter of 1913 had been one of heavy rains, culminating in the flood which reached its highest level at the end of September, when two-thirds of my land was submerged. All the low ground between the Yngleses and the woods of the Real Viejo had disappeared below the sea of water, and only the tops of the higher rushes showing above the surface indicated the position of the great cañadons. In consequence, all sheep had been rafted-out in August, and the cattle withdrew themselves to the mainland; whilst, naturally, there remained no incentive for the stockmen to make their usual rounds of inspection. At the end of November the gradual subsidence of the flood had left in one particular locality an extensive flat of mud, shallow water, and a small island or two. With a clear survey of half-a-mile or a mile on each side, and surrounded by our biggest and deepest cañadons, it would be difficult to imagine a more secluded and suitable situation for a breeding-haunt of the Coscoroba Swan. The actual date (21 November) is a late one; but I take it that the magnitude of the flood, submerging all other possible breeding-sites, retarded the usual nesting-period.

When word was brought me of a "Pueblo" (colony) of Swans, I proceeded to the scene under comfortable circumstances; placed deck-chairs and a table in the raft and ensconced my family therein with a luncheon-basket; harnessed a couple of horses in front and tied on a canoe behind; and so "drove off" in state, the only trouble being in the deeper water, when the raft threatened to surge on to the backs of the swimming horses. Seen at a distance of half-a-mile as we approached from the Estancia direction and cleared the last rush-belt, the clearly visible nests appeared as dark mounds, with the birds beside or sitting on them—in the latter case doubly conspicuous. These very shortly retreated in the direction of the Real Viejo cañadon, and remained in evidence as scattered pairs fully a quarter of a mile off. On the raft reaching shoal-water, I left it and waded about. Eleven nests I actually examined (ten with eggs and one with young); three were too awkwardly situated to reach; and two had apparently hatched out—total sixteen (to the group may be added one more, about half-a-mile off, which I had taken the previous day). The last-named I noted in detail as a curiously well-built, solid, and most tidy truncated cone, constructed of small dry water-weeds and roots, representing an extraordinary labour in collecting and fastidiousness in arranging. Twenty inches high, three feet wide at base and two feet at top; the hollow eighteen inches wide and no less than ten inches deep. Lined with small dry grasses, rootlets, and some down; part of this drawn over the six eggs, completely covering them from sight, even when I stood beside the nest. The other sixteen nests were scattered over an area of say four hundred by four hundred yards, sometimes far apart, sometimes close together: for example, those built where there was still some shallow water, were generally upon what was evidently a drowned-out ants' hill; whilst the single grassy islet which had escaped submersion had along one side (and quite on the edge of the water) no less than three nests, some twenty yards from each other. They were all more or less similar to that already described, no uncouth structures, but substantially and tidily built and finished, with no stray or superfluous material lying around. Only in one case (where the situation chosen was in rather deeper water amongst some durasnillos and water-weeds, and the nest in consequence particularly high and well-shaped) was there at one side a pile of dry water-weeds. Generally speaking, they were from twelve to twenty inches high (according to site); from two to three feet across at base, and twenty to twenty-four inches at top; cavity at top from ten to eighteen inches across, and four to six inches deep. One nest alone had the eggs totally covered and hidden by the lining being drawn over them; in all the others the clutch was fully exposed. Of the ten nests visited, one contained five eggs, two had six, while six had (the general clutch of) seven. The one brood of six young, of same age as those previously described, were similarly huddled-up together outside the nest in the shelter of a tuft of emerald-green grass, mute and sleepily indifferent to the group of human beings around them. A large nesting-colony of Brazilian Stilts (*Himantopus brasiliensis* Brehm) lent more than sufficient noise and animation to the scene—flying, fluttering, running, or crouching whilst they clamorously protested against the intrusion. One of their nests, containing four eggs, was only five feet distant from the base of that of a Swan, forming a pretty contrast and picture, for both were isolated on a little dry knoll formed by an old ants' nest. One could imagine the two sitting birds: the graceful neck of the Swan bending down to listen to the gossip of the Stilt—"Yes, some people say unkind things about the length of limb I display, and my Parisian scarlet hose that reach to my waist. But I could tell you some stories about Lady Candida over there, she who insisted upon her husband taking that out-of-the-way mud-flat at the beginning of the Season; and her goings-on, for all she looks so white and stately! Why, only last week . . . ! !"

This Swannery was perhaps the most interesting bird-colony that I have ever seen, not forgetting that of the

Dominican Gulls on the samphire-clad mud-flats by lonely Cape San Antonio on the melancholy Atlantic, nor those of the smaller Gulls and Terns, where the wild graceful birds circle and cry over a wide expanse of blue water and green water-grasses. Or even where, amidst a wilderness of dark green rushes in the heart of an immense swamp, there are myriads of nests all round; and the air is filled with thousands of the parent birds, Snowy Egrets, Roseate Spoonbills, Glossy Ibises, Blue Herons, and Grey Night-Herons. Doubtless the surroundings of the Swan's sanctuary rendered it the more impressive: ringed round with great swamps, backed by the limitless Pampas, broken along the horizon by Tala woods or the groups of trees that mark a puesto; no cattle to be seen, nor signs of human life as far as the eye ran reach, only the white buildings of the Yngleses head-station standing boldly out against its woods, a couple of miles away. Given the modern conditions of Argentina, I much fear similar occurrences will soon become a thing of the past, even in our remote district; and it is well to put them on record.

In coming to the Ducks proper, I would draw attention to the difficulty attending their full identification and frequency of occurrence, with other observations pertaining thereto. Particularly this is the case with the Teals (five species), and the two Pintails, the Brown and the Bahama (*Dafila spinicauda* Vieill. and *D. bahamensis* Linn.). The trouble arises from the enormous number of the birds in this district, particularly when the swamps are normally or abnormally full of water, and more especially in the spring season when the immigration is at its height. At other times of the year, or if a partial drought has reduced the water-area, the observer readily identifies and makes a mental note of the recurrent individuals and flocks. But it will easily be understood that on those occasions when countless myriads of birds rise with a roar like thunder on being disturbed, or the air is filled with a flighting snowstorm spread over thousands of acres of marshes, the result is most bewildering, and recalls the aphorism of "the wood being so thick that one could not distinguish the trees." Any well-known or characteristic species presents no difficulty; and even their relative proportion to each other may be correctly or approximately determined. But those I have alluded to blend with each other and become so mixed-up in the general kaleidoscopic throng as to impede a satisfactory individualisation and estimate. I am sure that my diary is frequently blank due to the natural hesitation produced by this cause alone.

340. **Dendrocygna fulva** Gm. Fulvous Tree-Duck.

In the Ajó district the migration and abundance of this species is subject to much variation. Regarding the former point I have observed flocks so early as 8 August, and also coming in as late as 4 May. Why it should have appeared in force in the early spring of one famous flood-year (1877), and in the still greater inundation of 1913 been actually scarce until midsummer, is a problem beyond solution, the conditions being similar.

In 1877 the number was almost incredible. Huge masses covered the grass-land immediately bordering the swamps for hundreds of yards in length with a depth of from five to twenty yards. These rose reluctantly, not in flocks but solid blocks, and the sound of the wings and clamour of voices was overpowering. What the impression produced upon me at the time was, may be gathered from my diary thirty-seven years subsequently, when (on 4 March, 1914) after chronicling in my diary a flock of some five hundred which had passed closely over my head, "their confused cries resembling the crackling of rain upon a hot iron plate," I find myself sadly adding "but where are the birds of 1877, which lined the shores of the cañadas in serried brown phalanxes, or broke and rose with a noise like thunder, and permeated the whole atmosphere to the horizon with brown sun-motes?"

Fulvous Tree-Ducks are stupid birds, by no means shy or wary. I have drifted past them in a canoe, between the rushes and the bank where they were assembled, and done great execution shooting "into the brown" as they rose; or similarly stalked a flock, most of which were asleep. But no longer do they pass at night over that modern Babylon, the town of Buenos Ayres, where, like Hudson, I have heard "the shrill confused clangour of their many voices from the darkness over the Argentine capital."

Undoubtedly a handsome bird when at rest "in its rich chestnut and fulvous plumage, and its pale blue bill and legs," to again quote Hudson, the charm is gone on the wing. The head and neck seem to droop and the tail and feet are similarly deflected below the level of the back, producing the effect of a ponderous and laboured flight, totally distinct from that of all the Anatidæ I am familiar with.

I cannot claim Hudson's knowledge regarding the breeding-habits of the species. In our district it is not given to nesting, notwithstanding its abundance. Indeed, incredible as it may seem, I can only chronicle half-a-dozen cases, of which three occurred in marshes and as many on dry land. The first-named were situated in dense flag-beds, and built of dry material of the same; the others amidst grass, with no lining. The marsh-birds endeavoured to entice the intruder from the vicinity; the plain-birds rose immediately at the horse's feet and flew away. The corresponding dates vary from 14 November to 9 February, showing that this species is a late breeder. Thirteen was the largest clutch (much incubated), followed by one of ten (also incubated); the remainder were incomplete.

Like Hudson, my characterisation of the colour of the eggs is white; but a clutch in my possession certainly tends towards buff (this, though not taken by myself, was procured by a collector in whom I have every confidence). The shape is roundish, and the average measurement is 57×45 mm.

344. **Heteronetta melanocephala** Vieill. Black-headed Duck.

Claude Grant writes: "This is by no means a common

Duck in the Ajó district: it frequents, singly or in pairs, open sheets of water in the larger reed-beds; it swims rather low in the water and reluctantly takes to flight." I may add that it is very shy and wary, quietly disappearing amongst the reeds so soon as canoe or horseman appear on the scene. On one occasion, however (28 February, 1899), I succeeded in obtaining two males and a female out of a flock of about twenty, which were in company with a large number of the Yellow-billed Coot (*Fulica leucoptera* Vieill.) in the middle of a deep cañadon. Neither before nor since that time can I recollect having seen more than a single pair.

I can furnish no information as to the breeding-habits.

345. **Querquedula cyanoptera** Vieill. Blue-winged Teal.

I have little to add to Hudson's brief account of this handsome Teal, so generally distributed and abundant.

A curious incident occurred on 31 October, 1915, when, in the early morning, a pair alighted on the brick chimney of one of the peones' quarters in the patio of the head-station. They remained there for a quarter of an hour, allowing me to approach the base of the building (to within a few yards of them indeed) and contemplate their beauty at my leisure.

My diary only chronicles three nests. The first, taken on 30 November, 1898, was situated on an island amidst swamps, where it had for neighbours three nests of the Brown Pintail (*Dafila spinicauda* Vieill.). That of the Blue-winged Teal consisted of a hollow amongst the grass, thickly lined with down. The bird sat close, on a clutch of nine fresh eggs. The second, taken with the bird, on 7 December of the same year, was placed amongst some thistles at the edge of a swamp, and consisted of a little dry grass, with some down (the clutch being only five). These two nests were procured by myself in person. The third and last, collected for me on 17 October, 1909, had ten eggs, but is wanting in data as to situation and materials.

The second of the above clutches averaged 50 × 35 mm.

The third, 48 × 34 mm. The eggs, of a warm cream-colour, are somewhat elongated in shape, with a distinct butt or blunter end.

346. **Querquedula flavirostris** Vieill. Yellow-billed Teal.

Hudson gives a description of the habits of this, our commonest Teal. And Claude Grant enlarges upon the same in application to our district.

Whether it is migratory or not I do not know; but a fresh fall of rain in the winter or spring invariably brings it into evidence; and the familiarity and tameness of the species constitute it a pleasing visitor. Strangers to the Yngleses are surprised and interested to find these Teal frequenting the garden of the head-station, where they roost at night and not infrequently nest. Curiously enough, the trees adjacent to, or overhanging the principal paths (or those in the immediate vicinity of the dwelling-house), seem generally to be the favourite situations; and it is at their own convenience, and not from any movement of passers by, that the birds leave their perch in the morning, sometimes considerably after sunrise, and go off to their feeding-grounds. I have recorded more than one instance when, on their return in the evening, a pair or more have passed low down over the heads of the tennis-players, or through the patio itself, quite members of the community.

Claude Grant correctly describes this Teal as being also entirely a tree-nester in our locality, whereas Hudson's experience is that it breeds on the ground. My own record is both long and voluminous, and I have never known the former rule departed from. The nests which formerly came under my observation were invariably situated in one of the chambers of the pendent communities of the Green Parrakeet (*Bolborhynchus monachus* Bodd.), not on the *top* of them, as stated by Claude Grant. Only so late as 1913 did I first chronicle an exception to my dictum, when no less than three nests were placed in eucalyptus trees in the garden, on the top of the accumulation of bark and leaves which had formed where the great trunk bifurcated, about twelve or fifteen feet from the ground. That this situation was of an abnormally hazardous nature is proved by the fact that, in the course of my investigations, I found the denizens to be a pair of truculent opossums, with the result that I was nearly startled into falling off my ladder. Away back in the 'seventies, when the Parrakeet nested solely in the tala trees, I have frequently been able to take a Teal's eggs by simply drawing down the pendent nest of the former with a walking-stick, guided in my quest either by the Teal flying out, or the presence of its down at the entrance. But these simple days passed away when I drove the Parrakeet to take refuge in the loftiest eucalyptus trees (as described elsewhere) and the Teal followed it.

The Yellow-billed Teal nests early in the season. On the 26th of August I have taken the first eggs, and during all the month of September and until the end of October it is still laying. The first eggs laid are merely placed on the rough twig floor of the Parrakeet's chamber ; but as they increase in number a lining is formed of down, ultimately to such an extent as to appear in the entrance to the nest and thereby betray the occupant. The clutch varies in number ; I have found the bird incubating five eggs, and taken nests of eight and even nine.

Hudson describes the eggs as of a "reddish cream-colour"; Claude Grant as "pale cream-colour and slightly glossed." The latter is the more correct definition. The shape is of the Teal type, but individual specimens vary, from the elongated with a large and small end, to the more strictly oval or rounder form.

Two clutches of six and seven average respectively 52 × 38 mm. and 51 × 39 mm. Amongst the former are such extremes as 49 × 37 mm. and 54 × 38 mm.

347. **Querquedula versicolor** Vieill. Grey Teal.

I regret being unable to add any further notes to Hudson's short account of this species. Beyond the fact that it is fairly abundant, the Grey Teal would seem to have presented no salient features for my observation.

Of its breeding-habits I have only one solitary record (of forty years ago) when, on 10 October, 1877, I trapped a sitting-bird in a lucerne patch at the head-station, in the garden. The nest itself, amongst weeds, etc., was composed entirely of down, and contained a fine clutch of nine eggs, somewhat incubated. Unfortunately, I have no note of the said eggs and their ultimate destination, nor does the British Museum seem to possess any specimens. From the foregoing exceptional case, it is to be judged that the Grey Teal is not in the habit of nesting in our district.

348. **Querquedula torquata** Vieill. Ring-necked Teal.

Male and female. Iris dark brown; bill slate-blue; legs and feet pale pink or flesh-colour. (*Note*—Hudson describes the bill as "reddish" and feet "brown," which is obviously at variance with my own notes.)

The pretty Ring-necked Teal is not a frequent visitor to our district, generally appearing in September in the shape of an occasional pair. During that month in the big flood year of 1913, I noted various pairs and one small flock; after the beginning of October and until my departure at the end of March, absolutely none were seen; and in the following spring (flood-conditions still prevailing), I failed entirely to chronicle its appearance. It is not therefore surprising that Claude Grant makes no allusion to the species, his visits to the Yngleses taking place when the great drought was in its inception.

On arrival any individual pair shows a preference for an isolated pond or pool, even though in the vicinity of traffic or close to human dwellings, and it is therefore more likely to come under observation and be recorded than various of its congeners—say, *Q. brasiliensis.*

Like Hudson, I am ignorant of the breeding-habits of the species. No information on the subject has come my way, nor, it would appear, are there any eggs in the British Museum.

349. **Querquedula brasiliensis** Gm. Brazilian Teal.

This beautifully-coloured Teal is only a visitor to our district; and that only in flood-years. Hence it is known as such, under the name of "Patite de creciente"—little duck of the flood. In normal seasons it is not to be looked for, but should one of our periodic inundations lay the country under water, the advent of the Brazilian Teal may be confidently expected.

The spring and summer of 1913–14 specially bore out the previous dictum, when various pairs were observed by myself and others, from the middle of October to early in March. One one occasion I saw two pairs together on some marshy ground; and on another date no less than three pairs at a pond in the Yngleses garden. Only in rare cases have I seen the species associating with any other Teal. The open water it is to be found upon is always in the vicinity of woods or trees, and it is still more partial to a pond situated in a wood—or even a garden, as mentioned above. It is surprisingly tame, and may be passed at close quarters in its favourite haunts near the head-station—quiescent on a pond, where I frequently passed within ten yards of a pair—or perched on a tree or the shears of a cattle-well. Again, when on the wing, no member of its family—not even excepting the other Tree-Teal (*Q. flavirostris*)—will show such disregard for the gunner, as it threads its way through the trees, or glides down into the water close in front of him.

During my brief visit to the Yngleses in the spring of 1914, with a still heavy flood, I only noted one pair—in the garden.

Both Hudson and Claude Grant particularise the flight—with depressed wings, by which the spectator is gratified with a full view of their beautiful colouring. Otherwise, I agree with the latter's pronouncement that the flight is "low and swift," not "slow" as judged by Hudson.

Our people do not call it the "Pate Portugues" as quoted by the last-named writer—"to signify that it comes from Brazil"—but, as previously stated, "Pate de creciente," which means in the vernacular, "Duck of the rise in water," *i. e.*, flood.

It was on the 4th of November, 1913, that a gang of peones were lassooing a steer for the butcher-department amongst the scattered trees on the verge of the head-station woods, when the noise of the fray drove a Brazilian Teal off her nest; and one of the boys advised me of the unique incident. On examination I found that the site adopted was a previous year's nest of apparently the Yellow-breasted Marsh-bird (*Pseudoleistes virescens* Vieill.), situated in the top of a stunted tala tree about eight feet from the ground, flattened down somewhat by the weight of the sitting bird and eggs, but without lining of any kind.

The clutch of seven eggs (slightly incubated) is most interesting. Pure white in colour, glossy, and inclined to be spherical in form, they might much more easily be attributed to an Owl than a Teal. The shell is not thick, but of a china-like hardness—the worst I ever employed drill upon. Average measurements 48 × 35 mm.

350. **Dafila spinicauda** Vieill. Brown Pintail.

Iris dark-brown; bill varies from yellow or greenish-yellow to orange-yellow, with black culmen and tip; legs and feet olive-grey.

The Brown Pintail is our commonest Duck, and is found all the year round; but it is in the autumn that it is most abundant, when there frequently occur flocks rivalling the enormous masses of the Fulvous Tree-Duck (*Dendrocygna fulva* Gm.), which I have already described. The thistle-beds are a favourite resort when the seed is ripe; also the maize-fields at the time the crop is being gathered and the cobs collected in heaps. The consumption of the grain on these occasions is of serious import, considering the size of the flocks and their individual capacity. I cannot at the moment recollect the amount counted from a shot bird the crop of which burst on striking the ground, but it certainly exceeded a large handful. It does not necessarily follow that the above localities are solely favoured, for on the 15th of August (end of winter), 1902, I find myself writing "Extraordinary number—many thousands—of Brown Pintails in cañada extending from Monte del Tigre into the

Rincones." These were entirely Pintails, without the admixture of any other species; and the curious thing is that only a fortnight previously I had been remarking on their scarcity. As Hudson says: "In favourable seasons the Pintail is a resident; but like the marsh-gulls, pigeons, the American golden plover, and all birds that live and move in immense bodies, it travels often and far in search of food or water. A season of scarcity will quickly cause the flocks to disappear from the pampas; and sometimes, after an absence of several months, a day's rain will end with the familiar sound of their cry and the sight of their long trains winging their way across the darkening heavens." Nevertheless, in the spring of the two flood-years 1913–14, the bird was only fairly abundant, in small or moderate numbers. Later on, in January and February, when it made its appearance in great force (many flocks running into perhaps a thousand each), it was associated with the Fulvous Tree-Duck in equal numbers, and to a considerable extent with the Rosy-billed Duck; but again, by the beginning of March, the last two had left it in almost sole possession of the scene.

Don Clemente Onelli, Director of the Buenos Ayres Zoological Gardens, informed me that during the year 1916 (which was one of extreme drought all over the Province), he had trapped in the grounds and pinioned—with the loss by deaths of only five—no less than 518 wild-duck. These, nearly all Brown Pintail, had been attracted by the ponds in the Gardens, and the domesticated wildfowl thereon. Yet certainly no one would pronounce the said Gardens to be situated in a suburban, much less rural, locality.

However plain in appearance, the Brown Pintail ranks high in the sportsman's appreciation. Most palatable on the table, always to be found for a spare hour's shooting or a big day's battue, and neither stupidly confiding nor wildly shy, the gunner's motto may well be "shoot and spare not." Many years ago one of the members of our Yngleses staff was leaving for England, and in anticipation had sent off his heavy luggage and gun by sea to Buenos Ayres. Like all Devonshire men, he was a keen shot and somewhat of a collector, and it having occurred to him in the interval that he would like a pair of Chilian Eagles (*Geranoaëtus melanoleucus* Vieill.) for the hall at home, he borrowed my gun and cartridge-belt, and went in their quest. At sundown he duly returned with a fine pair of the birds in question (there were then known to be two or more pairs in the lonely fastnesses of the Rincones), and forty Brown Pintails "for the larder." "How did you do it?" I inquired, referring to the latter item, and was rather taken aback on observing that there were only four cartridges missing from the belt he returned to me. "Well," he replied, "I had got the two Eagles all right, and was riding home when I observed a large flock of Pintails at a pool of water in the open camp, so I managed to stalk within range somehow, and gave them the first barrel 'sitting' and the second as they rose. Two dozen of the spoil I left with Pedro Gomez, the cattle capataz, who had accompanied me through the Rincones, and the remainder you see." The total result was therefore sixty-four Duck for two shots. On another occasion a guest at the Yngleses—also a good shot and one who knew of old the "lay of the land"—went off for a day's shooting, accompanied by a peon. About midday the boy returned, with a request for another hundred cartridges, and the message that "Don Jorge said it would be advisable to send one of the small 'lamb-carts' to a certain point later in the afternoon, as he already had more birds than the two horses could conveniently carry." I have no record of what the bag aggregated in this case, but it was duly obtained by legitimate wing-shots (not firing into the brown) and by one gun.

In parenthesis I would remark that our "big shoots" were always a worry to me in connection with the disposal of the game. The Gaucho, as I have stated before, is contemptuous of everything but beef or mutton—fish and birds are beneath his notice. The shepherds of foreign nationalities—Spaniards, Basques, Italians, French or Scandinavians—do not altogether share this prejudice, but dislike the cooking-trouble involved. And at the back of all is an inherent idea that the employer is trying to save his cattle and sheep by the offer of a substitute—is defrauding them in short. Accordingly, whilst I could make use of a large quantity of fish or game at the head-station, where the cooks were under my orders and there was a large staff and still greater peonada, my appeals to the shepherds when they came for their meat—to " take all the birds they liked, in addition to their *free* meat-rations "—were of little or no effect.

To return from this digression :—

It might have been expected that the Brown Pintail would be a regular breeder in the locality, and that to a considerable extent. But such is by no means the case. I had passed twenty-five years at the Yngleses without recording an authentic occurrence; and if, since then, I have been more fortunate, I am utterly at a loss to account for the previous hiatus. In 1898 I took my first nests, noting (in November) that the species was " very abundant, and nesting generally." The following year only produced for me three clutches. There is then a gap until 1904, when nests were very numerous. During subsequent springs I was much away from Ajó, but 1913 found me again beginning to record " various nests." Most of the seasons above alluded to were of much water and correspondingly rank herbage suitable for nesting-covert ; but there had been similar springs previously, notably that of 1877 ; while two nests taken in 1909 (drought) were situated in the bare open camp with no shelter or protection. The parent bird, as mentioned by Claude Grant, sits very close, and consequently is rather startling to one's horse when it rises. My earliest date is the 3rd of October, the latest 30th of November : most of the nests occurring in the last-named month. With the exception of three taken in the Rincones and situated amongst esparto, all my notes refer to " a hollow amongst grass, preferably upon an island in the swamps." In one such place there may be various nests, placed within a few yards of each other. The hollow is lined with only a little dry grass at first, but the quantity of down continues quickly to increase until it envelopes the eggs.

The clutch frequently exceeds the limit attributed to it by Hudson and Claude Grant. In 1904 I note that it "generally consisted of eight or nine, but sometimes ran up to ten, eleven, or even twelve."

The eggs are cream-coloured and vary in shape, sometimes lengthy but more often roundish. Individual specimens also differ in some clutches. The average measurement of half-a-dozen clutches is 52 × 40 mm.

351. **Dafila bahamensis** Linn. Bahama Pintail.

Never abundant in our locality at any time, the Bahama Pintail would seem to be an autumn or winter visitor, at epochs varying from early in February to the middle of August. "A pair, two or three, or a few" are the meagre entries in my diary; sometimes seen alone, at other times in company with *Dafila spinicauda*. It has occasionally fallen to my gun, but in habits and flight evidently does not differ much from its above-mentioned congener, for it has furnished me with no material for any specific notes.

Neither Mr. Hudson nor I are cognisant of the breeding-habits, and it is to the courtesy of Mr. James Wells, of the British Museum, that I am indebted for the following description of the eggs:—"In form of a long oval. The shell has but little or no gloss. They are of a uniform cream-colour, and measure from 55–59 mm. in length and from 37–39 mm. in breadth." They are therefore both longer and narrower than those of *D. spinicauda*.

352. **Mareca sibilatrix** Poepp. Chiloe Wigeon.

The Chiloe Wigeon is a most handsome bird, wary and strong on the wing to correspond; hence the sportsman shows a justifiable pride on turning out one or more specimens from his game-bag. "Chirivi" it is called from its cry, and never in our district "Pate picase" (as stated by Hudson), the latter name being reserved for *Metopiana peposaca* Vieill.

It is resident, but most abundant in wet seasons, and particularly in the autumn and winter—for example, in the spring of two great flood-years (1913 and 1914) it was conspicuous by its rarity or total absence, whereas it was very numerous in the autumn. A heavy fall of rain at the latter season is generally responded to by a prompt advent of this species, when it rarely associates with other Ducks, and prefers open camp ponds or even pools on the roadway to the rushy fastnesses of the cañadas. It generally occurs in pairs or small flocks of ten or twelve, but on suitable occasions (*i.e.*, after a heavy rainfall)—and always in the autumn—I have known these to consist of thirty or forty each, the flocks being numerous and closely associated—still in the open.

I am totally ignorant of its breeding-habits, and for a description of the eggs am again indebted to Mr. Wells, who says:—"Eggs in the Museum collection vary from cream-colour to whitish-brown and measure respectively 61 × 40 mm., 60 × 40, 59 × 41, 58·5 × 41, 56 × 40, 54 × 41." He further continues:—"Holland, Ibis, 1892, p. 208, says the eggs of *M. sibilatrix* are white in colour and very round; Nehrkorn, Kat. Eiersammlung, p. 244, says his eggs are rothlichgrau and measure 57 × 42 mm.; and Hudson, Argentine Orn. ii. p. 135, says the eggs are pure white. Rather conflicting evidence!"

353. **Spatula platalea** Vieill. Red Shoveler.

The Red Shoveler is resident all the year round, and not uncommon, particularly on the brackish lagunas and cangrejales of the Rincones. It is generally found in pairs, of which there may be several, or quite a number, on a large laguna; whilst in the autumn I have frequently seen small flocks, never exceeding six or eight birds. It is not shy, nor is it called upon to be so, for it is the least popular of the Duck family from an edible point of view, being spare in flesh and rank in flavour. Hence I have often observed its immune tameness on the cangrejales adjacent to the large cattle-killing Saladero in the neighbouring township of Ajó, where the workmen slightingly alluded to it as the "Pate de cangrajal." The colouring of the male is undoubtedly rich, but lacks the all-round brilliancy of, say, the Chiloe Wigeon; solely when rising close to the observer, and with the additional aid of a strong sunlight, does it show to advantage.

Hudson makes no allusion to its nesting-habits, and I have no information myself on the subject. The British Museum however, through Mr. Wells, furnishes me with a following description of the eggs:—"These are elliptical or long oval in shape. The shell somewhat glossy and of a uniform rich cream-colour. Measurements from 49–57 mm. in length and from 35–36 mm. in breadth."

354. **Metopiana peposaca** Vieill. Rosy-billed Duck.

This Duck, known in our district as the "Pate picaso," is undoubtedly the king of all the Duck family of my acquaintance, pre-eminent in size, weight, and handsome appearance. It is generally distributed and found in pairs; in the autumn large flocks occur, associated with the Brown Pintail (*Dafila spinicauda*). In the former case it would seem to prefer the deeper and central pools in the cañadones, but the larger congregations (in which males predominate) assemble about shallow ponds or marshy hollows in the open camp. Wary in its habits, as becomes a bird so much sought after by the pot-hunter, it is certainly not so wild as the Chiloe Wigeon (*Mareca sibilatrix*). The flight, after a heavy rise, is bold and powerful. The note a loud and harsh "quack."

If the sportsman shows a justifiable pride in producing from his bag of Duck a specimen of the beautiful and wily Chiloe Wigeon, as I have previously remarked, he also exhibits much satifaction in turning out a couple of Rosy-billed Ducks. A pleasure accompanied with a sigh of relief, for the latter is a portentously heavy bird; and, it may be added, a very finely-flavoured table acquisition.

The breeding or nesting-habits of the species are somewhat peculiar. Hudson's dictum simply pronounces for "a nest made on swampy ground near the water, of dry rushes, and is, for a duck, a deep well-made structure ; the eggs are oval in form, cream-coloured, and twelve in number." Claude Grant (in a drought season) "only took two sets of eggs, and both of these were in the nests of *Fulica*, which contained the eggs of that bird also. The natives say that this is the usual custom of the bird, and assert that the Coot brings off the young."

My own experience is similar to that of the last-quoted observer—showing the parasitical habit of the species. I have taken from one to several eggs in such nests as those of the Southern Courlan (*Aramus scolopaceus* Gm.), both Swans (*Cygnus nigricollis* Gm., and *Coscoroba candida* Vieill.), the Spot-winged Gull (*Larus maculipennis* Licht.), and even, strange to relate, the Maguari Stork (*Euxenura maguari* Gm). It is in the nests of all three *Fulicæ* however (*F. armillata* Vieill., *F. leucopyga* Hartl., and *F. leucoptera* Vieill.) that it is generally and abundantly found, though I doubt very much if it is a welcome visitor there, or if the Coots actually bring off the young ; for I have often found the mixed assortment covered over with water-weeds, and a fresh lot of Coot eggs laid. On one such occasion I removed sixty-four Coot and Duck eggs (some fresh and others more or less incubated) from one nest in successive layers ; possibly there were more, but, leaning from my horse, with my arm plunged into the water up to the shoulder, whilst my full pockets and shirt-bosom threatened my equilibrium, I could not be quite satisfied that I had reached the foundation of the original structure—doubtless resting by this time on the mud at the bottom of the water.

Per contra (*i. e.* as a nesting-bird on its own account) my diary contains the following instances:—On the 3rd of November, 1913, I observed on the bank of a cañada a pair accompanied by a large brood of young in down. In December of the same year, a trustworthy informant saw on one of the large drainage canals in this vicinity a female

Rosy-billed Duck, in front and at the sides of which there swam no less than fifty-two young, all small, no other duck being in the vicinity. On 20 November and 9 December, 1915, one of my collectors took two nests, each containing ten slightly incubated eggs; these nests were constructed of dry flags in a covert of the same.

I should describe the eggs as the roundest of all the duck tribe, though closely approached by those of the Fulvous Tree-Duck (*Dendrocygna fulva* Gm.). They are of a buff-colour, and average 59 × 45 mm.

355. **Erismatura ferruginea** Eyton. Rusty Lake-Duck.

Of the Rusty Lake-Duck it may be said that its occurrence in our district is less uncommon than elusive. Claude Grant correctly summarises the situation when he states that "this Duck is not commonly observed in the Ajó district, where it frequents the open water surrounded by reeds. On being alarmed it dives after the manner of a Grebe, and I have never seen it take to the wing. When swimming, the tail is held upright and the body lies very low in the water, which almost closes over the shoulders" ('Ibis,' April 1911, p. 350).

I have frequently come across a pair of these Ducks, either when noisily forcing my way through the rushes on horseback, or moving quietly along an open channel in a canoe, on emerging into an open lagoon in the deeper and more solitary swamps. Watchful, sombre, silent, and shy, they are observant for a moment or two, then seem to settle lower down in the water in an almost imperceptible manner, and finally vanish below the surface and gain the shelter of the reeds. Their dive to the flash of a gun is generally successful; and, in a word, their habits are evasive in the extreme. Mr. Hudson's brief notes are also corroborative of these peculiarities.

Under such circumstances it is natural to assume that the possible discovery of a nest is due only to mere chance or a most diligent search. I herewith put upon record such few instances as have come under my notice. In 1875 I was shown some eggs undoubtedly of this species, but no details were furnished me. At the beginning of December, ten years later (1885), occurred a fully-authenticated case, the bird being trapped on the nest, after previous attempts to shoot it had failed, owing to the quickness with which it dived on being disturbed. The nest was placed amidst reeds in a deep cañada and built of dry stems of the same; it was somewhat similar to a Waterhen's, but larger and with a deeper hollow; it contained six much-incubated eggs, covered with down. Two other nests, identical in position, materials, and number of eggs, were chronicled about the same time. My last and only remaining find was on the 5th of December, 1891, when I note the taking of a fine clutch of twelve (now in the British Museum). These "were nearly all quite fresh. The nest was situated in a deep swamp, amongst the 'juncos'; was built of the same, and resembled that of a Waterhen, though somewhat larger, deeper, neater, and cup-shaped." Only a few days previously I had seen a similar nest, containing two eggs, about a hundred yards away; and the doubt arises as to a possible connection between the two: whether the larger clutch had not been supplemented by the second pair of birds, the three preceding nests having furnished only six eggs each.

The eggs are of a broad oval shape, the shell granulated in texture, without gloss, and of a uniform whitish-cream colour. They measure from 68 to 73 mm. in length, and from 48 to 54 mm. in breadth.

357. **Columba picazuro** Temm. Picazuro Pigeon.

Iris orange; bill pale blue; feet magenta.

It is fortunate that in my previous paper ('Ibis,' 1880, p. 6) I dealt at some length with the habits and customs of this handsome pigeon in our locality; for, to judge from my diary, it is undoubtedly becoming a scarcer visitor. Formerly, I never actually considered the species as resident on the Yngleses in spite of a few nesting-pairs. I had always reason to believe that the temporary occurrences originated from the Montes Grandes—the large woods situated some fifty miles to the south of us—where I was given to understand it was a numerous and permanent resident. Single birds, pairs, or flocks, always came from that direction and returned the same way, possibly the same day.

Until about the year 1900 the winters were characterised by the regular appearances of visitors in search of food. In 1899 I chronicled various flocks, generally consisting of eight or ten birds, but including one of thirty, and a still larger lot of about a hundred. These appeared very early in the morning, coming over the neighbouring Real Viejo, and returning similarly at sundown. It may be recalled that another winter visitor, the Patagonian Parrot (*Conurus patagonus* Vieill.), presented identical habits; but whilst the Parrots penetrated as far as the Rincones and found their special food in that district, the Pigeons halted midway (I have only once seen a bird in the Rincones), to exploit any maize-fields, though I shot one individual which had its crop solely distended with nine "durasnillo" berries, as large as marbles. Since the last-mentioned year, however, the occurrences have been so few as to make the species almost a rarity. I note a flock of seven or eight in 1902, and the remainder of my entries refer to a single bird or at most a pair, at long and increasing intervals.

Whilst I am unable to explain the curious local decrease, it is a solace to read that Claude Grant (who had collected five specimens at the Yngleses in 1908–10) saw "vast flocks settling on the sand-banks in the Alto Paraguay, so very wary that it was impossible to approach within shot" ('Ibis,' July 1911, p. 459).

As formerly chronicled, I took two nests in 1873, and four in 1875. I was told that two or three pairs nested in the Yngleses head-station woods in 1904, but without further particulars. In 1909, one egg was brought from the adjacent Real Viejo woods, bearing the early date of 10 October. This specimen, of an elongated shape, measured 38 × 27 mm. It is to be noted that my record still establishes the Picazuro Pigeon as laying only one egg, whilst Hudson gives the number as two.

359. **Zenaida maculata** Vieill. Spotted Dove.

I find nothing to add to my former notes and those of Hudson upon this exceedingly common Dove. My experience confirms the impression that it is the most dominant factor of bird-life in our woods and gardens, where its presence is as charming as it is harmless. I have a distinct impression that, away back in the 'sixties, as a child, I used to find the nests within my reach in the woods, so general and confiding was it.

There is much variation in the size and shape of the eggs. A large clutch may average 34 × 23 mm.; a small one 29 × 22 mm., the general average being 31 × 22 mm.

362. **Columbula picui** Temm. Picui Dove.

Iris white; eyes mauve-coloured; bill black; feet dull mauve, or magenta, or pink.

In my former paper ('Ibis,' 1880, p. 7) I chronicled this species as a winter visitor, and apparently of rare occurrence—"two or three small flocks of from two to half-a-dozen frequenting the garden and lucerne-field in 1874." And again, in 1876, "I caught a glimpse of one in the garden." Such were my sole records.

From about 1898, however, the situation had entirely changed. The summer of 1898–9 saw the species abundant about the Yngleses head-station, and evidently nesting (a pair of full-fledged young were observed in February); and from that time onward it became resident, with a general distribution. My diary maintains a steady record of pairs and small flocks—the latter principally in the autumn and winter—of adults and young, sometimes aggregating twenty in number. The woods, lucerne-fields, and gardens are the favourite haunts, the last-named particularly; for this dainty little Pigeon is exceedingly tame and confiding. A pair of young would let me pass within a yard of them in front of the dwelling-house; and a compact group of ten on the garden-path suggested the idea that I should try and throw my handkerchief over them. Another, but more unusual locality, has been a dry swamp not far from the woods.

I have not yet observed it on the open plains, as frequently occurs with *Zenaida maculata*.

Only half-a-dozen nests have actually come under my notice, but some of them present special points of interest. For example, the period ranges from 23 August, when, in bitter cold weather, I was amazed to find a bird sitting on two eggs, up to the end of December. Further, I have observed fully-fledged young, not long from their nursery, on such far-apart dates as 21 November and 8 February. My first nest was not obtained until 1895, or twenty-one years after I took up residence at the Yngleses; and the remainder at long intervals up to 1916, when I myself was only a visitor. These nests divide themselves into two distinct forms—either a few feathers are placed upon an old nest of, say, the Mocking-bird (*Mimus modulator* Gould), or the Guira Cuckoo (*Guira piririgua* Vieill.) in a thick "Quebrachillo" or "Coronillo" tree, six or eight feet from the ground; or, a special structure in a small "Tala" or other tree with no attempt at concealment, and at a similar height. I transcribe the following notes regarding one of these:—"Placed in the fork of a stunted and isolated Tala tree on the confines of a wood. So like in appearance to that of the Black-headed Siskin (*Chrysomitris icterica* Licht.) and so unlike a Pigeon's, that, in spite of the bird flying off, I could hardly believe in the fact until I saw the eggs. The nest was small, rather deep, built of rootlets and fine dry grass, and copiously lined with feathers of the parent birds. By an odd coincidence, its discovery was due to my firing at the moment at a fine specimen of its big congener, *Columba picazuro*, 'the first seen for a long time.'" The preceding incident took place in 1901, and the concluding remark in my journal would seem to be a prophetic anticipation of the transposition of the two species to which I have drawn attention in the present paper, the spread of *Columbula picui* and the decrease in *Columba picazuro*.

The pure white and oval eggs show very little variation in size and shape, averaging 24 × 17 mm.

364. **Engyptila chalcauchenia** Scl. & Salv. Solitary Pigeon.

Iris yellow; bill black; feet pink, inclining to magenta.

Claude Grant's statement regarding the occurrence of this species ('Ibis,' July 1911, p. 466), in which he says:—"I have an adult female from Ajó collected by Miss Runnacles in September 1909; this is the only example recorded from the locality," caught my attention, and led me to watch for any recurrence during my following visits to the Yngleses. Accordingly, on the 14th of March, 1914, I recorded a pair observed on one of the garden-paths. And the following day, a most stormy one, on crossing the patio to the office, I found lying in front of the door a very fine specimen, quite dead, but still warm. It seemed to me a rather comical if sad instance of self-assertion.

It has been borne in upon me that the species is not so uncommon with us as might be supposed. As a wood-inhabitant—our woods being dense and with much undergrowth—it might easily be confounded with the innumerable individuals of the Spotted Dove (*Zenaida maculata* Vieill.), in spite of its larger size. And I have little doubt that in my former ignorance I had assumed it to be the latter, possibly in immature plumage. Abundant, I think, it cannot be, or Claude Grant would not have failed to gather it in himself.

369. **Rallus maculatus** Bodd. Spotted Rail.

With the exception of the Black Rail (*Rallus rhytirhynchus* Vieill.) my knowledge of the Rails and Crakes in our district is of the most limited description; nor is it likely to be otherwise, in view of the topical conditions. Mr. Hudson alludes to their "abundant supply, for which Nature has provided the more swampy districts of the pampas"; but I have never found them here in proportion to the vast areas of swamp and grass-coverts, esparto, pampa-grass, and "junquille negro," which I have described in the preface to this paper. I make all allowance for their semi-nocturnal and rat-like habits, by which they evade the notice of the horseman, or the gunner on foot unless accompanied by a dog;

but I continue to maintain my thesis of their general rarity. Perhaps the most striking example is that of the Ypecaha Rail (*Aramides ypecaha* Vieill.), that large and handsome species, which Mr. Hudson refers to as "ranging as far south as the thirty-fifth parallel of latitude, and abundant along the marshy borders of the Plata, where it frequents the vast reed-beds and forests of water-loving *Erythrina cristagalli*"; and which he follows up with one of his characteristically descriptive accounts of the bird and its curious ways. Well, to judge from my experience, it would seem to be entirely unknown in our locality. I have never seen or heard it, nor have the natives ever mentioned it to me.

After this digression, it will not be a matter of surprise that I only record two occurrences of the present species (*Rallus maculatus*). On 20 December, 1898, I shot a specimen—now in the Dresden Museum. In connection with this individual, of which I note the feet as "red," it is to be observed that Sclater and Hudson's plate correctly reproduces the colour, whilst by a clerical error the letterpress makes use of the expression "pale brown." The other bird was brought to me on 8 November, 1913, too much mangled by a dog for preservation.

370. **Rallus antarcticus** King. Antarctic Rail.

Iris reddish; bill dark crimson, darker above; feet yellowish.

The only entry in my diary refers to an occasion when, on 24 July, 1899, I observed two specimens, separately, of this species. I was riding in the Rincones at the time, which, that winter, were flooded by rain-water coming from the interior. On the Ysla de Gonzalez in a flooded "espartillar," we put up a Rail, naturally unable to adopt its usual tactics of skulking away amongst the covert. Twice it flew a short distance; then, hotly pursued, dodged about on the surface of the water, but without attempting to dive until disabled by a lucky whip-cut. The specimen, a very fine one, now reposes in the Buenos Ayres Museum. The other bird, seen that day under similar circumstances, made good its escape.

371. **Rallus rhytirhynchus** Vieill. Black Rail.

Adult male and female. Iris vermilion or blood-red. Bill bright green, varying to strong dark green, with bright scarlet spot at base, and pale or bright blue forehead. Feet ranging from pink or salmon-colour to red and dark crimson-brown. These colours are all paler or duller in young birds.

This species is resident and common, more so in some years than others. In 1899 I collected half-a-score specimens between 27 February and 30 October, showing that they are seldom migratory in our district.

Though generally shy and difficult to flush, the Black Rail can, as Claude Grant says, "be easily procured by waiting" (he might have added "at dusk, by the edge of the swamps"). When the observer is quiescent, or the birds have been accustomed to his watching them, they become remarkably tame. This species walks in a quick jerky manner, with head and tail very erect, stopping at intervals and keenly alert; when alarmed or surprised on these occasions, it generally rises, and after a short flight drops into the deeper part of the cañada. Hudson has fully described its vocal accomplishments. In the flesh it is a beautiful bird (I do not allude to its ungainly flight); but when the brilliant hues of the eyes, bill, and legs have departed, and the life-gloss gone out of the deep slate plumage, the cabinet-specimen presents a poor and dull appearance.

A drought is more suitable to the Black Rail than a superfluity of water. I noted it as "very abundant in the summer of 1903–4, though little water in swamps." The converse is borne out by the following memoranda from my diary:—"27 October, 1913. On railway journey from Buenos Ayres, when between Guido and Segurola stations, three Black Rails seen at close intervals: flew out of the densely-weeded railway embankment as the train passed, the country being flooded to the horizon on each side.—20 March, 1914. The preceding seem to have been the only individuals observed during the six months' visit. Great flood." On 30 August, 1915 (having been in England in the interval), I write: "Flood still in evidence. Curiously enough, on same railway journey and as nearly possible the same locality, two pairs of Black Rails were flushed, as I half-expected.—31 October. None others seen during my two months' visit to the Yngleses."

Hudson finishes his descriptive account without any allusion to the nesting-habits of the species, and Claude Grant is equally silent on the subject. I, fortunately, am able to fill up the omission, various nests having come under my observation. The season would seem to be the first half of November. Only one nest was situated in a cañada, where it was placed in the middle of a clump of "juncos"; it consisted merely of a bed of dry rushes lined with finer stems of same. The favourite locality would seem to be where, on certain sandy districts of the Yngleses and Tuyu estancias, there occur clumps and jungles of the "junquillo negro," bordering swampy hollows and cañadas of more or less extent; and in such situations I have taken as many as three nests in one day. My first find (which only took place after eleven years' residence at the Yngleses) is sufficiently applicable to all the other cases:—"Placed in an isolated and thick clump of junquillo negro about two feet from the ground. Only a bed of dry grass (with a mouse's old nest for foundation!). The bird (male) sat so close that I endeavoured to take it with my hand; then it reluctantly slipped down through the bush, and I shot it as it emerged at the base and took to flight."

Four is the general clutch, five the exception. The eggs are of a pointed oval form. The shell slightly glossy; of a whitish cream-colour with small well-defined spots of reddish brown scattered sparingly over the surface, but more frequent at the larger end. They measure from 41 to 45 mm. in length, and from 32 to 32 mm. in breadth.

375. **Porzana salinasi** Philippi. Spot-winged Crake.

Iris bright red; bill black; feet grey.

My only record of the occurrence of this species consists of two skins collected for me on 17 September, 1899. They were reported to be both females (which seems doubtful, if they were procured on the same date). My informant had further noted that their food consisted of insects, seeds, and marsh-weeds. These specimens went to the Buenos Ayres Museum, where the late Dr. Berg told me the species was "rare."

377. **Porphyriops melanops** Vieill. Little Waterhen.

Iris red; bill bright pea-green; feet olive-grey, slightly inclined to green on front of tarsus.

The Little Waterhen is a summer visitor, appearing about the middle of September, and leaving towards the end of March. Generally speaking, I would call it decidedly uncommon, to judge from the paucity of entries in my diary. The one exception, dated 16 September, 1913, reads as follows: "A few seen, whilst on railway journey from Buenos Ayres to Dolores. Great flood." Then, a week later, on repetition of the same journey: "An extraordinary number of Little Waterhens observed, swimming or flying away from the vicinity of the line as the train crawled along the almost submerged embankment. Quite the most abundant of all the aquatic family." Yet I found none of these at Ajó, indeed I only chronicled one individual on the Yngleses during my ensuing six months' stay there.

I have not many instances of its nesting with us (only some three all told), but they will serve the purpose. The nests were placed in cañadas amidst water-grasses, not rushes, and were built of dry grass, or the rootlets of water-weeds; rather small and very neat. Two were taken on the 15th and 16th of November, with two and four eggs respectively. A later one, on the 4th of December, contained a clutch (much-incubated) of four.

The eggs are of a blunt oval form; the ground-colour brownish-buff, marked and blotched with purple, and covered with spots and specks of a rich chocolate-brown, most numerous at the broader end; some specimens show twisted lines of dark brown. They measure from 38 to 43 mm. in length, and from 28 to 31 mm. in breadth.

378. **Gallinula galeata** Licht. American Waterhen.

Adult male. Bill and frontal shield bright scarlet, like nothing so much as sealing-wax, tip of bill yellow. Legs and feet bright pale green, at base of tarsus a scarlet band nearly half-an-inch wide ; claws horn-colour.

Adult female. Similar to male, but the scarlet band at the tarsus becomes only a scarlet spot or mark, situated behind, and not more than an eighth of an inch deep. The preceding notes are from a pair in full nesting plumage (2nd December).

The American Waterhen may be, or may not be, common in our locality. I confess, honestly, that among the multitude of individuals it is difficult to differentiate it from the Red-gartered Coot (*Fulica armillata* Vieill.) and the Red-fronted Coot (*Fulica leucopyga* Hartl.). If it is borne in mind also, that all three are possibly mixed up with myriads of the Yellow-billed Coot (*Fulica leucoptera* Vieill.), which is a confident and easy-going species, whilst the others promptly disappear amidst the rushes on being disturbed, it will be more readily understood how the observer is liable to be at fault as he strains his eyes for the points of identification.

I was fortunate enough to procure the nest along with the parent birds referred to at the beginning of this notice. It so happens that amidst the sandhills and scattered woods of the Yngleses head-station, there lies a deep pool and a marsh (two or three hundred yards square, according to the season) ; one-third open water, the remainder a jungle of rushes, flags, "durasnillos," and water-plants, intersected by two or three waterways. Ten years ago I formed this into a sanctuary by enclosing it with a strong post-and-wire fence, leaving only as much of the clear water as was necessary to water some of the cattle. Within the enclosure I kept a small canoe, available for exploration of the reed-beds or as a vantage-point for observation. The locality, though only ten minutes' walk from my house, was removed from the frequented approaches to the head-station ; and my people were given to understand that it was immune from disturbance or any gunning except my own. It will be readily imagined how, under these circumstances, the natural covert attained an unusually favoured and luxurious growth; where the feathered denizens or visitors became of a singularly interesting nature—an aquatic aviary in short on a large scale, open to the sky, and visited by constantly recurring novelties or rarities. Also, the isolation of the said "Charco" or pond (for it is situated about a mile from our swamp-land proper), and its limited area constituted it a world by itself, where observations could be taken with some degree of accuracy.

Here, early in November of 1913, I located a pair of the American Waterhen. Previously, on 11 October, I had taken a nest of the Red-gartered Coot (*Fulica armillata* Vieill.) with a fine clutch of ten eggs, and shot one of the birds; after which the other abandoned the locality. Subsequently, when I took the Waterhen's nest, there were also nesting two pairs of the Yellow-fronted Coot (*Fulica leucoptera* Vieill.), but these were productive of no confusion. A pair of the Thick-billed Grebe (*Podilymbus podiceps* Linn.) furnished me with the welcome and novel discovery of their breeding-habits in the shape of my first nest. Nesting also was that curious bird, the Southern Courlan (*Aramus scolopaceus* Gm.); and I was enabled to watch its interesting and grotesque habits at first-hand. Of all the other numerous species of waterfowl and reed-birds I need say nothing, beyond mentioning a pair of the beautiful black and flame-coloured Marsh-birds (*Amblyramphus holosericeus* Scop.) which were haunting the tops of the rushes, their flute-like notes indicative of a nest which never materialised.

For the moment, however, the Waterhens had the first place in my regard; and on the 9th of November I located their first nest. This was situated at the edge of a small bed of juncos near the fence, in rather deep water, and about twenty-five yards from the Courlan's. It was built of green water-weeds, circularly intertwined, not an untidy structure like that of the Yellow-fronted Coot, and consequently the eggs were comparatively dry. It measured about a foot in diameter, and the slight depression for the eggs half as much across; it rested on the surface of the water, above which it rose some three inches, and was held in place by the surrounding juncos. On the said date there were two eggs, which I left. Both birds were observed at the time, remaining away on the far edge of the shallow swamp outside the fence, and on the whole very silent and indifferent to my presence; one indeed approached to within forty yards of the canoe, where, resting amidst the water-weeds, it preened its feathers unconcernedly, until a Courlan flew along and perched in an ungainly fashion on a post of the fence just over its head, when the Waterhen scuttled away with a musical little cackle of protest.

On the 16th of November, I was chagrined to find the eggs gone, though the birds were still about. On the 27th, however, I found a new nest (the birds themselves not being visible) with three eggs. These, again, I left until the 2nd of December, when, the clutch numbering seven, I took possession of them, and they proved to be slightly incubated. On this occasion I had given up all hope of getting even a glimpse of the parent birds, when, on once more standing up in the canoe, I espied the male on a little adjacent island in company with a Yellow-billed Coot. I shot it, and subsequently secured the female, on the opposite side of the charco in clear water beyond the fence. This nest was situated in the larger, but opener, rush-bed. It was built of dry junco stems and lined with green water-weeds; not at all an untidy structure; it was about five inches high, thirteen across the base and ten at the top; with a neat hollow for the eggs, six inches across and two deep.

The eggs were of a warm greyish brown ground-colour, speckled with red-brown, and with larger and stronger mottlings of same, the latter increasing towards the blunt end. Two of the specimens had a very few brown streaks; and equally scarce were some faint sub-surface pale lilac spots.

The eggs vary in measurement from 49 × 32 mm. to 46 × 32 mm.; general average 47 × 32 mm.

If I have been over-diffuse regarding the nesting-habits of the American Waterhen, my excuse must be that it and the three Coots have caused me endless trouble for many years, before arriving at what I take to be their proper identification, an annoyance which I would wish to spare other observers and collectors.

379. **Fulica armillata** Vieill. Red-gartered Coot.

It may be assumed that the Red-gartered Coot is fairly abundant in our district. The difficulty is to separate it from the next species, the Red-fronted Coot (*Fulica leucopyga* Hartl.) in its usual haunts ; and still more so the differentiation of its general and nesting-habits as distinguished from the latter. At a distance, both present a bill of strong scarlet and yellow ; whilst, on the other hand, the markedly distinct colour of the feet is hidden under the water. Except when nesting in some particularly isolated situation, the Red-gartered species is shy of observation, and promptly disappears amongst the rushes ; and it haunts the deeper swamps in preference to the more open waters. The only cry with which I associate it is a sharp note or whistle of alarm when the observer is in the vicinity of its nest, but even then the birds may put in no appearance at all ; indeed the latter is almost invariably the rule.

Some half-dozen authentic nests, of which no less than five were taken in 1913 (three in the one day), vary in date from 11 October to 2 December ; the bulk being towards the end of November. A couple of these were secured with the parent birds ; in the other cases the occupants were not seen, and only occasionally heard amongst the surrounding rushes. The preferable situation would seem to be just within the junco covert, adjacent to open water, and in the deeper cañadas or cañadones ; two, however, were outside the rushes proper, amidst the water-weeds. The materials used are either dry junco stems, lined with finer fragments of the same ; or various water-grasses, also lined with their broader leaves and other green stuff ; but all fairly dry. A slovenly structure is exceptional ; it is generally well built with a depression varying from saucer- to cup-shape. Height above the water some four to six inches ; generally twenty inches across the base, and ten to fourteen at the top; the diameter of the cavity seven to ten inches. Two of these nests contained eggs (two each) of the Rosy-billed Duck (*Metopiana peposaca* Vieill.); one was also infested with a colony of the pugnacious red ant. The clutch is most irregular; one of five was much incubated; another of ten slightly so; whilst a third of nine had a mixed assortment, some being much incubated and others nearly fresh.

The eggs are of a greyish-brown ground-colour, spotted with violaceous (sub-surface) and dark red-brown marks, the latter rarely of a large size. They present much variation in shape and measurements, even in an individual clutch. The average of some fifty specimens gives us 55 × 38 mm.

380. **Fulica leucopyga** Hartl. Red-fronted Coot.

Male. Bill bright yellow with scarlet spot at base and scarlet frontal shield; feet olivaceous.

Female. Bill and frontal shield scarlet, tip yellow; feet olivaceous.

In both sexes the scarlet occasionally becomes deeper red or dark crimson.

My general remarks on the Red-gartered Coot apply equally to this species. The Red-fronted Coot also, as compared with the ubiquitous Yellow-billed Coot, is a minor quantity. It is of similar habits to the first-named bird, a frequenter of the shelter afforded by thick belts of rushes in the deep water. During the first part of our last great flood, from the middle of September to the end of March, 1913–14, I only chronicled a few individuals. In September of the following spring (1914), under similar conditions, I occasionally detected one amongst the Yellow-billed flocks, "perhaps one in thousands." Later on, at the beginning of November, having occasion to leave the Ynglesces, and land travelling being impossible, I went down by boat to the neighbouring town of Ajó (sailing in places over my wire-fences!), and there hired an available nafta-launch for the purpose of proceeding up one of the large drainage-canals to the nearest railhead. The said canal (of great width) had its capacity increased by the excavated earth being embanked fifty yards back from the edge on each side; and in abnormally wet seasons, not only was the canal itself full, but this no man's land also, or at least a jungle of water, mud, and rushes. It can be imagined, therefore, what an ornithological panorama unfolded itself to my eyes during the long journey of fifty or sixty miles, surely as lonely as one of our great cañadones. An occasional shanty at the greater side-sluices, and perhaps once or twice a horseman silhouetted against the sky as he picked his way along the outer embankment which shut in my view, were the only indications of human life from early morning to nearly sundown. Beyond on either hand, but hidden from me, was, as I knew, the flooded pampas; in front and behind stretched the lane of water and rushes to the very horizon. The number and variety of Waterfowl was extraordinary; and these, taken by surprise as the smooth-running and noiseless launch slipped through them, either gave way or dived (it was comical to see such birds as the Cormorant and Great Grebe, busy with their avocations, dive hurriedly at almost arm's length, to re-appear astern in an utterly demoralised condition); or hurriedly flew and scuttled into the adjacent covert—few passed over the embankment. Amidst many notes I took, was the census of the Coots. The Yellow-billed kind was uncountable ("in myriads"), and of course unmistakable. The other two species, under the above circumstances, could not escape identification, and I jotted down twelve of the Red-fronted birds. The largest of the family, the Red-gartered Coot, did not furnish a single individual.

The one note I have heard produced by the Red-fronted Coot, when one happened to souse into the water near me, consisted of a cackling laugh.

Seven authentic nests (all taken in the year 1898), date between the 2nd and 20th of December. These were generally of slight structure, but cup-shaped; and placed in the shelter of the rushes. The material used was almost invariably dry water-grasses. The clutch ranges from four to seven, the majority being of six.

The ground-colour of the eggs varies from a light cinnamon or pale buff to a warm or rich buff. It is speckled and spotted with red-brown and mauve, partly underlying; super-imposed again are larger red-brown spots or blotches, heaviest towards the blunt end. They are very uniform in size and shape, and average 53 × 38 mm.

381. **Fulica leucoptera** Vieill. Yellow-billed Coot.

Iris red, or dark-red.

There is apparently some confusion in Claude Grant's notes on the three *Fulicæ* ('Ibis,' July 1911, p. 462). Under *Fulica armillata*, he says: "All three species of Coot (*F. armillata*, *F. rufifrons*, and *F. leucopyga*) are found in the Ajó district, though no specimens of the last species were obtained. On all the swamps Coots simply swarm." But he actually follows *F. armillata* with *F. leucopyga* itself (of which there are four specimens), and the statement that "it is the commonest of the three Coots".

In the claim to abundance, the Yellow-billed Coot (*F. leucoptera*) admits of no rivalry. But it is when feeding on the low shores, and at a considerable distance from the water, as described by Hudson, that it frequently amazes the beholder by the magnitude of its flocks. In the vicinity of the Laguna Milan I have seen the plain black and absolutely hidden by such an assemblage, extended over many acres; while in the wild rush and flight back to the water, on being disturbed, the birds seemed actually to be touching each other. (In parenthesis :—A few years ago, during the great flood, I knew the manager of a neighbouring English estancia, who wrote to his town-agents in great distress bewailing that the enormous number of Coots were depleting of grass such area of grazing-ground as still remained above "the face of the waters." I am afraid that on my advice being asked as "a man who knew something about birds," I was credited with levity and altogether deprived of my high estate, when I suggested that the only saving measure was to "round-up" and pluck the Coots in lieu of shearing the harassed sheep!) On the water, if alarmed or surprised by the sudden appearance of an intruder, they scurry along the surface as mentioned by Hudson, until removed from danger. Given a large laguna on one of these occasions, with its customary quota of Coots, the water is broken into a sheet of foam, and the noise produced becomes a startling roar, where previously had reigned the most peaceful quiet.

I agree with Mr. Hudson that it is when the bird is swimming about concealed among the rushes that the notes are most heard. The listener, if quiescent in a canoe, is surrounded by the weird and sometimes sepulchral chorus of cries and laughter in varying tones, with an occasional rattle of the juncos or dash of water as the birds pursue each other; he knows that probably watchful eyes are upon him, but he himself never catches a glimpse of his eerie neighbours, though fully aware of their immediate proximity.

From the middle of September to the middle of December is the extent of the nesting-season. When floods are out and the lower lands adjacent to the cañadas covered with shoal-water and water-weeds, the Yellow-billed Coot makes no attempt at concealment but builds freely in the open, entirely disdaining the shelter of rush and reed-beds. Often the nests are close together, four or five within a short radius, but in any case they are so numerously dotted over the large suitable expanses that an hour or two in a canoe will produce a fishing-basket full of eggs. These nests at first are only floating platforms of wet water-weeds, slovenly put together, and so low that (except for its immobility) the sitting-bird is hardly to be distinguished from those swimming in the vicinity; but as time goes on the nests are added to, and become drier and more shapely. On being disturbed the parent birds remain at a considerable distance, and only give utterance to an occasional croak. In normal seasons the nest is situated at the edge of a rush-bed, either on the confines of the swamp or a pool of the same; the structure is then composed of rushes or water-grasses, with more pretensions to design and solidity, and with a little dry lining.

Hudson gives the number of eggs as ten or twelve. But I have only twice taken even as many as eight. Clutches of five or six were generally considerably incubated. The ground-colour is of a greyish brown, with specks and small spots of very dark (almost black) reddish brown, which are evenly distributed over the whole surface. There is much and considerable variation in the size and shape, particularly as regards eggs of the same clutch. The average measurement of a large number is 48 × 33 mm.

I have alluded to the confusion produced by the great similarity (in the flesh) of the American Waterhen and the three species of Coot; and have in the preceding notes detailed, to a wearisome extent, the description of their respective nests and eggs. But there seems to be no infallible standard for the situation and structure of the former; and the latter vary so much in size and coloration as to run all the species into each other. Were all my specimens mixed together, I should be unable to identify them except by their reference-numbers; and it is only by laying the component clutches of the four species in juxtaposition that I am able to deduce general considerations as follows:—

Those of FULICA ARMILLATA (av. 55 × 38 mm.) are the largest. Warm in colour and boldly marked.

Those of FULICA LEUCOPYGA (av. 53 × 38 mm.) are so similar to the preceding as only to be distinguished by their smaller size.

Those of FULICA LEUCOPTERA (av. 48 × 33 mm.) are cold in the ground-colour and darkly speckled. Typically Coot-like, and much smaller than the other two.

Those of GALLINULA GALEATA (av. 47 × 32 mm.) closely resemble the first two, but are more richly warm in the ground-colour; the markings are of a more vivid red-brown, with a greater tendency towards the blunt end.

382. **Aramus scolopaceus** Gm. Southern Courlan.

The "Viuda loca" or "Mad Widow" I described in my former paper ('Ibis,' 1880, p. 161).

Hudson, in 'Argentine Ornithology,' when dealing with the mollusk which forms its subsistence, evidently refers to a bivalve which is unknown to me. The exclusive food of the Courlan in our district is the abundant and large water-snail (*Ampullaria canaliculata* Lamarck), already mentioned by me as similarly constituting the sole sustenance of a bird of a very different family, namely, the Sociable Marsh-Hawk (*Rostrhamus sociabilis* Vieill.).

From the beginning of the great flood in the middle of 1913, and during all its continuance, the Courlan was extraordinarily abundant. Though not gregarious in the strict sense of the word, certain situations in which the food-supply was evidently particularly favourable seemed to draw large numbers together in groups up to half a score. In a small submerged "durasnillal" between the head-station woods and the cañada proper, I put up some fifty or sixty one day in March of 1913. These "rose like a flock of Ibises, but sombre and uncouth in appearance; about twenty of them perched on the very tops of adjacent Tala trees, where they looked if possible even more ungainly and weird than when on the wing." Only a week previously, when riding out at sunrise near the above locality, I found about thirty Courlans still roosting in a clump of willow trees at a bridge, in company with a large number of the Dark Night-Heron (*Nycticorax obscurus* Bp.) and the Sociable Marsh-Hawk (*Rostrhamus sociabilis* Vieill.); the first-named slowly abandoned their perches and flew down the cañada, whilst their associates scattered generally in a similar leisurely manner. The same afternoon, returning home lower down, I put my horse through the so-called "Estancia pass" (myself atop the "Chaja's" nest), and found a Courlan's nest amongst the rushes at the very edge of the pass, midway. The young, jet black, were hatching out, and as I endeavoured to steady my horse for a moment they proceeded at once to scramble over the edge of the nest, which was low down in the water. The date, 24 February, seemed very late; corresponding to the end of summer. The perching-habit of the Courlan is, so far as our district is concerned, a very unusual trait: previous to the introduction of wire fences I had never seen an instance; and of tree-perching the above two are the only cases chronicled. In its composite character this bird only looks its best when it is itself, *i.e.* as a Rail; when it poses as a Crane it is a failure. It walks and runs not ungracefully in the former part; but as an aviator it must either have forgotten or never learned the latter's vocation (see Hudson's and my own description of the flight), whilst it looks quite out of place in a tree. The wild shrieks which give rise to its vernacular name of "Mad" or "Crazy Widow," are generally produced at any hour of the night, as the Evil Spirit moves it; but occasionally may be heard late in the afternoon. Should the observer be in the vicinity of the nest the disturbed bird frequently utters a short grating double-note; whilst, if visible, it will be seen to move about on the ground, with jerkings of the head, body, and tail, or crouch down and raise itself repeatedly.

The nesting-period is more extended than I previously stated, ranging from the middle of August into January and to the end of February, but mostly falling in the first half of December. A total of a dozen nests in the course of forty years is not much to boast of, but it is all the number my diary records. One explanation is furnished by the almost invariable situation in the deepest of a cañadon, and where the junco is thickest; consequently, the horseman—fighting his way anxiously and painfully through the dense covert—is very apt to overlook the none too obvious structure, the materials of which, along with the eggs, harmonise most completely with the surroundings in colour. Only in the "Charco," or small laguna I have previously described, has it been in my power to conveniently examine a couple of nests from the comfort and ease of a canoe. These, thoroughly typical of the usual construction, were placed amongst the reeds or rushes (by which they were supported and sustained) in the shape of a platform resting on the surface of the water. Built of the same materials in a dry form, and rarely with any finer lining, the height is only a few inches above the water, and the shallow receptacle fourteen to twenty inches across. Needless to say, the bird always leaves or approaches the nest by flight, not by swimming or wading. The Courlan is much victimised by the Rosy-billed Duck (*Metopiana peposaca* Vieill.); one of my entries mentions a nest containing six eggs of each species; another refers to there being two only of the rightful owner, and no less than twelve of the Duck.

Mr. Hudson puts the clutch as high as ten or twelve. I have never known it to exceed seven; and even five may be incubated. The large eggs are rather round or elliptical in shape. Two typical sets of six and seven respectively vary as follows in appearance:—First clutch of a dull white ground-colour, marked with spots, blotches, and streaks of pale brown and purple, becoming confluent at the blunt end; all the eggs having also a general floury appearance. Second clutch pale brown or buff in ground-colour, with strongly marked large brown and violaceous blotches, and some bold brown streaks, all increasing and becoming larger towards the blunt end; none presented the floury or powdered covering. (N.B. The latter curious effect, though not uncommon in some clutches, is by no means universal.)

There is little variation on the whole in the size of the eggs, the average measurement of which is 59 × 45 mm.

385. **Parra jacana** Linn. Common Jacana.

The Jacana—which I have seen in conjunction with the Victoria Regia water-lily in the backwaters of the Parana river at Asuncion in Paraguay—is not only a rare visitor to the Ajó district, but, like the Brazilian Teal, is entirely confined to years of exceptional floods.

Mr. Hudson gives a full description of the species and its habits in words worthy of his dainty and charming subject. For its pictorial delineation, I think only a Japanese or Chinese artist could render the necessary justice.

The flood of 1877 (subsiding in the early summer) did not bring the Jacana to my notice, nor did the equally brief one of 1884. It required the two-years' inundation of 1899–1900 to furnish me with my first record, *i. e.* after 28 years' residence. My attention was then drawn by one of my observers to an "unknown bird" which had made its appearance at the end of August 1899, on the open flooded land at the north side of the estancia. By the description given me of the stranger, and the way in which it ran about over the aquatic vegetation, I had no hesitation in judging it to be a Jacana; a surmise which was confirmed when the said observer and myself saw the bird again in the same locality two months later, and we then came to the conclusion that it also had a mate and nest in the vicinity. The ensuing winter (of 1900) a roughly prepared skin was brought to me from a locality on the coast, somewhat to the south of the Yngleses.

Ajó and the Yngleses knew the species no more for over a dozen years; when, as was to be expected, the three years' record flood of 1913–15 brought it to the fore once more, to my great gratification. From the end of August to the end of March seemed to be the duration of its stay each year, and there is little doubt of its nesting. It was also observed ("various individuals") on the neighbouring estancia of Las Violetas. On the Yngleses it was much localised, preferring the great open expanses free of rushes but covered with shallow water and surface vegetation of the "camalote" and duckweed nature. It could not by any means be called abundant; generally one was seen at a time, and on a certain red-letter day two pairs and an odd bird were observed on the western side of the estancia, not far from the Coscoroba Swans' nesting sanctuary. On the occasion when I navigated the great canal between Ajó and Santo Domingo, 3 November, 1915, the number counted was nine, consisting of two pairs and five single birds; but the conditions were exceptionally favourable.

The flight is low, swift, and straight, but not prolonged. Then, as also when they raise and stretch their wings, preparatory to flight—or for apparently the mere exhibition of their loveliness—I could imagine them to be fairy water-nymphs, assuming the appearance of birds for the nonce, to deceive and mock the mere human observer.

I have never heard them give utterance to any note or cry.

On 1 September, 1915, I found that a pair had taken up their abode in the small "charco" or pond close to the horse-corral, between which and the garden of my private house ran the road to the head-station (as public and frequented a position as could well be imagined). They undoubtedly nested; though, from want of time, or because I could not bring my heart to disturb them, I never verified the fact. They did not seem to mind the traffic on the adjacent roadway, only flying a short distance to the other side of the pond when directly approached by myself or another horseman. The pair presented much discrepancy in size; the larger, and which I took to be the female, was rarely seen after the presumed incubation had set in; previous to the end of October the pair had gone, and doubtless taken their brood (which I never saw) with them. Regarding the above-mentioned difference in size, I find it noted that of the five single birds observed on the canal on 3 November, four were small (males?) and one large (female?). This point again supports the previous assumption that the missing individuals were females, engaged in the act of incubation. I should much like to have this matter determined, as the facts were strongly impressed upon my mind.

386. **Vanellus cayennensis** Gm. Cayenne Lapwing.
Vanellus grisescens Prazak.

Though I have retained the former nomenclature, the correct placing of our Argentine species is undoubtedly the latter, as pointed out by Claude Grant ('Ibis,' April 1912, p. 274).

Besides my former notes ('Ibis,' April 1880, p. 161), there is now on record Mr. Hudson's far more complete account of the habits of this species. And it is with a mixed feeling of admiration and humiliation that I draw attention to his interesting and accurate description of its sociable interchange of visits for the purpose of amusement or play—a wonderfully systematical performance, as punctilious in the details as any set of quadrilles. Truly, to one human being is given the gift of distinguishing and co-ordinating what his visual sense observes; whilst another only sees a meaningless coming-and-going of the actors in the scene, conveying no signification to his dull mind!

A winnowing-out of my diary affords material for a few more remarks regarding this most familiar bird and the Pampas, of which it might be said that to one acquainted with them both, they are the natural concomitant of each other, and that it would be almost as impossible to mentally recall the "Terú-terú" without the Pampas, as these plains deserted by the "Terú-terú."

Moisture is one of its desiderata, and an open outlook another; hence it does not like the giant-grass coverts of the original pampa. But, to take a case within my own cognisance, when General Roca's expedition of forty years ago incorporated in the State an area of 15,000 square leagues of Indian territory known as the Pampa Central, and this vast and lonely country came under the development of the settler; then—wherever a rancho was built and a well dug, with the natural treading-out and grazing-down of the giant grasses and the formation of an open patch of sward—came from out of nowhere, a pair of the "Terú-terú," to be the companion and watchful associate of man, as much a creature of the new creation as the half-dozen poultry or the house-dogs.

Drought has naturally a bad effect on these birds, which, as Hudson states, are little given to migration or the shifting of their life-quarters. But when to this is added a winter of, say, great and continuous frosts, the mortality is distressing; under the double scourge of no water and a frost-bound soil, the unhappy Lapwings get thinner from day to day, and ultimately die of inanition. I have also known our severe hail-storms to be productive of many casualties; the closely grazed pastoral plains affording no shelter against missiles the size of hazel-nuts and upwards. On the other hand, flood-seasons favour the Terú-terú's scheme of life, and it flourishes accordingly. For example, I was amazed in the last great flood to find several pairs standing about on masses of floating vegetation in the very heart of our deepest swamps on the western side of the estancia, in default of *terra firma*. They did not nest there of course; but elsewhere every tiny islet—if only a ruined and deserted ant's nest—had its occupants with their "scrape" or mound of vegetation, and their mud-stained eggs; whilst they also occupied small openings amongst the woods, or nested within a few yards of the busy shearing or dipping corrals, their abundance being so great that after the spring of 1914 I find myself writing how "I do not pine to see Lapwing eggs on the table again for many a long day!" As an instance also of their tameness or familiarity with man at that time, is the following example dated 5 February, 1914: "Was much surprised to see a pair in the head-station patio in the middle of a hot day. It is true that, being the siesta-hour, everything was profoundly quiet, but nevertheless the occurrence is unique."

The eggs have been described by Hudson and myself. They are so similar in size and appearance to those of the Brazilian Stilt (*Himantopus brasiliensis* Brehm) as to be inseparable. Taken as a whole, and studying a very large series of both species in juxtaposition, I find that the Lapwing's are lighter in ground-colour, and the Stilt's has the markings much larger and stronger.

Those of the Lapwing average 46 × 33 mm., the largest clutch being 47 × 34 mm., and the smallest 45 × 32 mm. The Stilt's general average is 45 × 33 mm.; the largest clutch 47 × 33 mm., the smallest 44 × 32 mm.

387. **Charadrius dominicus** Müller. American Golden Plover.

The earliest appearance in our district of this migrant is the 10th of September, and it remains until the end of

February or the first week in March. It is most abundant with us in dry seasons, and prefers the open plains, though it also may be found on marshy ground or in the vicinity of lagunas. I have never seen the vast numbers alluded to by Mr. Hudson, flocks of perhaps one to two hundred being the limit of my experience. These are as a rule shy, at least to the man on foot. But on horseback I have approached closely to one such large flock, which, on being disturbed, only flew a short distance and settled down again close together, allowing me to walk my horse past at a very few yards' distance; and on looking back, I was interested to note that their similarity to the ground had made them practically invisible.

In former years I used to find the Esquimo Whimbrel (*Numenius borealis* Forst.) associated with this species.

The wild clear cry of the American Golden Plover is another of the familiar bird-notes connected with the pampas, and is equally dear to the naturalist and the sportsman.

388. **Eudromias modesta** Licht. Winter Plover.

The Winter Plover comes to us about the middle of April and would seem occasionally to stay so late as the end of September. Whilst Claude Grant speaks of it as common throughout the winter months, he adds: "usually singly." My own experience, like that of Hudson, is of a collective nature—in flocks varying from a dozen up to a very large number. With it is frequently associated the much larger and richly-plumaged Slender-billed Plover (*Oreophilus ruficollis* Wagl.). Both these species are very shy, scatter much in feeding, and run most rapidly, the latter bird particularly.

The sober garb and wild cry of the Winter Plover are in harmony with the season when it visits us, and together productive of a certain melancholy—the dull-coloured birds seen often under a heavy sky and the cry or note which speaks of the far-off and lonely Patagonian home.

389. **Ægialitis falklandica** Lath. Patagonian Sand-Plover.

Though this species is, properly speaking, also a winter visitor—arriving from the south about the end of April and leaving towards the end of August—yet a few pairs occasionally remain with us to breed, as I mentioned formerly in 'The Ibis,' April 1880, p. 163; hence the annotation in my diary during the summer months of various individuals, adults or young. These nesting cases are, however, exceptional: up to 1880 I chronicled four nests taken, since then only one, with the usual quota of three eggs; and two or three instances were noted, when the action of the adult birds undoubtedly indicated the vicinity of a nest.

In spite of Claude Grant's testimony to the abundance of the species, I have a feeling that the Patagonian Sand-Plover is not so abundant with us as formerly, and the surmise is borne out by my diary for many years past, the entries being often far apart and relating to individuals or pairs, with occasionally a small flock. Whilst generally affecting low marshy ground or the borders of lagunas and ponds, it is also to be found plentifully along the sea-coast (hence doubtless Claude Grant's conclusion, formed when he was collecting at Cape San Antonio and its vicinity); further inland a pond amongst sandhills is a favourite situation for a pair.

The last nest of my taking (28 October, 1885) was similar to those formerly described, a "scrape" with a few straws gathered into it, situated on a great mud-flat adjoining a swamp. The bird ran a few yards on leaving it and then crouched down.

The full description of the eggs, the full clutch of which does not seem to exceed three, is as follows: In shape a pointed oval. The ground-colour (devoid of gloss) varies from greenish grey to brownish buff, and is spotted all over with black, more pronounced towards the larger end. The measurements are from 36 to 39 mm. in length and from 25 to 27 mm. in breadth.

391. **Oreophilus ruficollis** Wagl. Slender-billed Plover.

Bill black; legs pink or pale magenta; feet blackish.

This very handsome and interesting Plover comes to us from the south about the beginning of April and leaves towards the middle of August. It is a shy bird, equally swift afoot and on the wing, and is generally found associated with the Winter Plover (*Eudromias modesta* Licht.) in more or less considerable numbers. From the large size and extraordinary fatness of the species it is much sought after by the gunner. Fortunately, the visual power of the enormously developed eyes and the constant activity and unceasing wariness stand the bird in good stead. The scattered flock runs rapidly over the open plain, and on the slightest alarm takes to flight and removes itself to safety.

Only in the act of taking wing is the note heard—a rich clear "churr," dying down and out.

I would put upon record that the skin of the Slender-billed Plover is one of the worst to deal with that I know. Apart from the great amount of fat, the skin itself—wet or dry—is as thin and delicate as tissue paper.

The species undoubtedly is King of our Plovers in size, carriage, and bold richly-coloured plumage.

392. **Hæmatopus palliatus** Temm. American Oyster-catcher.

This Oyster-catcher is a most striking bird and not likely to be overlooked, either on the lonely Atlantic sea-coast (of which it is a permanent resident and the principal one) or on the cangrejales and salt-water lagunas of the Rincones. The Laguna del Palenque on one side of the Yngleses and that of Milan on the other limit its range inland so far as we are concerned; and when, in the flood of 1913–15, these—and indeed all the adjacent cangrejales—ran to fresh water, the species totally abandoned the latter haunts and confined itself to the sea-shore.

It is always found in pairs, is not particularly shy, and the call is a loud clear note, frequently uttered whilst the bird is on the wing.

I have no knowledge of how and where the inland birds nest. But those of the coast are certainly late breeders—from the beginning of December to the middle of January (though I have taken a chick, several days old, so unusually early as 8 December). The nest, or "scrape," is a mere hollow situated amidst shells and sea-drift some distance above high-water mark, from which the birds can dominate all sides except the sand-dunes in the rear. Hence it is more easily found when the observer appears suddenly over these and marks the sitting-bird as it takes to flight.

Like Claude Grant, I have never known the clutch to exceed two, and I would go further and mention instances of a single chick or one much-incubated egg.

These eggs are very handsome, and if from their protective coloration not particularly distinguishable *in situ*, show up prominently in a cabinet. The ground-colour is either of a pale yellow or warm buff, marked with purplish spots and large bold dark brown or black blotches with some streaks of the same; below the surface there are occasionally a few smaller pale mauve spots and markings. They are of an oval-pointed shape, and average 55 × 37 mm.

393. **Thinocorus rumicivorus** Eschsch. Common Seed-Snipe.

This Patagonian bird visits us in the winter, arriving about 20 March and leaving early in September. The flocks vary in size from half-a-dozen to fifteen or twenty; occasionally even separate pairs may be found.

A curious combination of the characteristics of, say, a miniature Grouse and a small Plover, the Common Seed-Snipe is most interesting in many ways; and accordingly Mr. Hudson details its habits and manners of life at length and with much accuracy. I would emphasise, moreover, his account of how a flock will crouch motionless on the ground and submit to the presence amongst them of an intruder, if supposed to be harmless. I particularly recall, on one occasion, how I had drawn bridle at a piece of rough ground and walked by chance into the midst of one lot. On stopping altogether and glancing down, I caught sight of one bird nestling a little closer into its shelter or the black eye of another regarding me sideways; while strange little notes of warning and suppressed excitement seemed to emanate from nowhere and pervade the air around me; otherwise the flock was quite indistinguishable from its surroundings. The contrast between the confident quiescence of one moment and the sharp alarm-cry and wild flight when the birds elected suddenly to take their departure was most striking.

395. **Himantopus brasiliensis** Brehm. Brazilian Stilt.

In his description of this species Mr. Hudson commits the clerical error of attributing an orange colour to the legs, though further on he alludes to them as red. The latter is the correct shade.

To my former notes and Hudson's fuller account I find but little to add, and that solely in connection with the nesting-habits.

At the time I wrote in 1880 I had taken but one or two individual nests (by which I mean isolated or solitary cases); indeed, since then I have not chronicled more than two other similar instances. Finally, but for the fact that I took all four personally, I would have questioned their identity: firstly, because of their similarity to the Lapwing (*Vanellus grisescens* Prazak); and secondly, because the Stilt nests in communities—a fact of which Hudson is either unaware or has forgotten to put on record. I saw the sitting-birds leave the four nests alluded to, and the latter were so situated amidst mud and water that the eggs had to be placed upon a bed of roots, samphire-stems, and decayed water-vegetation, which is a resource rarely adopted by the Lapwing.

Given the abundance and general distribution of the Stilt in our locality, and the suitability of the terrain for the formation of nesting-colonies, it is surprising that those that have come under my notice should be so singularly few. As the nest is in the open, and not of necessity in very retired localities, whilst the birds themselves are particularly conspicuous, it is not a question of overlooking them, either on my own part or on that of the numerous shepherds and peones, who are all aware of my interest in such matters.

The season ranges from the 12th of October to the end of November, during which time the eggs found may be either totally fresh or mostly incubated. In 1881 I found my first colony; eleven years elapsed before my next (1892); the season of 1899 revealed two separate communities; that of 1904 one; whilst the great flood-year of 1913 had no less than four to boast of.

As has been said, there is no particular attempt to select a specially sequestered situation for the colony, though on the whole the birds prefer a locality where there are few intruders and little traffic. Open marshy ground and a wide outlook form the principal desiderata, and on the islands thereof, or the small extinct ants' nests amidst the shallow water—or anywhere that gives an opportunity to establish themselves—the birds form their homes. These, if the ground is at all sufficiently dry, may be a mere "scrape," with but little lining; but, as a rule, the nature of the site necessitates the construction of a regular bed or nest of vegetable matter, sometimes two or three inches high, and even then the eggs may not be quite dry. The nine colonies previously enumerated contained some ten to thirty breeding-pairs each (the general average being seventeen pairs). There is no definite rule as to the distribution of the nests in a colony; they may be closely situated or wide apart, according to the nature and facilities of the situation. In conclusion, of one point the oologist may rest assured, *i. e.*, the reality of his discovery of a nesting-colony of the Brazilian Stilt—the vociferous noise and extraordinary gestures of the parent birds will leave him in no doubt upon that point!

In 1880 I alluded to the similarity between the eggs of the Stilt and the Lapwing as follows: "The four eggs of *Himantopus brasiliensis* are very like those of *Vanellus cayennensis* (read *grisescens*), so like as to be almost indistinguishable. The ground-colour is somewhat richer and darker, and the black blotches larger, in my specimens; but it would be necessary to have a large series in order to be sure that this difference is really always existent." The large series is now forthcoming, and I find that, taken as a whole, the conclusion above arrived at is correct; whilst, curiously enough, individual clutches of both species occasionally present the opposite characteristics. Even in shape I have found the well-known though abnormal pear-form of the Lapwing repeated in a very beautiful clutch belonging to the Stilt. Size also is no criterion, the general average presenting but an infinitesimal difference. The Stilt's eggs average 45 × 33 mm.. the largest clutch being 47 × 33 mm., and the smallest 44 × 32 mm. The Lapwing's average is 46 × 33 mm., the largest clutch being 47 × 34 mm., and the smallest 45 × 32 mm.

397. **Gallinago paraguaiæ** Vieill. Paraguay Snipe.

The Paraguay Snipe is certainly rare with us. In bygone years I have occasionally seen a small wisp or flock on perhaps three occasions, if I recollect rightly; and my skin-book records four individual specimens collected, whilst the last entry in my diary goes back to 1899, when I saw a single bird. These occurrences took place in winter, in the months of May and June. Mr. Claude Grant got one specimen here in May of 1909, and I have a couple of eggs which were collected for me on 21 October of the same year. These latter are pear-shaped, spotted and blotched with dark brown on an olive-coloured ground, the markings increasing and becoming heavier towards the blunt end. They each measure 41 × 30 mm.

The adult bird has the iris dark brown; bill greyish yellow at base, deepening into black at tip; legs and feet greenish yellow.

It is with envy and regret that I compare the above meagre notes—the outcome of so many years—with Mr. Hudson's full and interesting account of the species and its habits.

398. **Rhynchæa semicollaris** Vieill. Painted Snipe.

This very pretty Snipe is as common in our district as the previous species is scarce. A note in my diary, for example, says (under date 15 February, 1899): "On one narrow strip of wet sedgy ground, about 150 × 30 yards, situated amidst cañadas, I walked-up some twenty-five birds; these did not rise in a wisp but individually, and looked like so many large butterflies from their bright colouring and erratic flight." It so happened that I wanted one or two specimens at the time, and it is illustrative of the feeble and short nature of the said flight that I never had a satisfactory opportunity of firing a single shot—notwithstanding a collecting-gun and No. 10 cartridges. A bird would rise at my very feet, flicker aimlessly for a few yards whilst I gave it some "law," and then drop like a stone again into the covert. I felt exasperated to the point of throwing the fire-arm itself at such a ridiculously unsporting member of a real game-bird family, or going home for a pocketful of brickbats in order to carry on the chase (as a matter of fact, it is not unfrequently knocked down with a riding-whip). However, it is not often seen collectively in such large numbers as the preceding; pairs are general, single birds occasional; a wisp of three or four may be a family party. My own observations of its habits are similar to those of Mr. Hudson and lead me to the same conclusion—that they are of a nocturnal or crepuscular nature.

The nesting-period is extensive, ranging from the 15th of September to the 15th of January, but the bulk of seventeen nests noted between 1874 and 1916 are embraced in the period—middle of October to middle of December. The nest is a mere "scrape" or hollow, occasionally lined with a few bits of dry grass, sheltered by a samphire plant or tufts of grass, and situated in marshy ground contiguous to a swamp. The parent bird sits close, and sometimes will hardly move from the vicinity of the nest.

The two eggs are oval-shaped, some being more elongated than others, but all are bluntly pointed at the smaller end.

The ground-colour is generally pale yellow or buff (on rare occasions bluish white), and this is densely spotted and blotched with black. As a rule these markings are evenly distributed, but sometimes they increase towards the blunt end or occasionally girdle the middle of the egg. Hudson mentions how, in many cases, the markings are so dominant as to submerge the ground-colour and give the egg a totally black colour.

The average general measurement is 35 × 24 mm., the largest clutch being 37 × 24 mm., and the smallest 33 × 24 mm.

399. **Tringa maculata** Vieill. Pectoral Sandpiper.

We now come to the Sandpiper family, regarding which I have the same complaint to make as in connection with the Teals and the Coots, the difficulty of separating and identifying similar species, amidst very large numbers. Who that has formed any conception of the extent of our enormous mud-flats at certain seasons of the year, and the variety of salt laguna and freshwater shores, can have failed to realise the mental confusion and bewilderment produced by the contemplation of myriads of the small and restless Scolopacidæ? They are all coming and going, flying and feeding, in continual movement and change, like the endless variations of a kaleidoscope. And should the observer endeavour to close-in somewhat in the hope of individualising any of the more uncommon species, the result is only to put up the whole gathering, still more indistinguishable on the wing. The fact that all these species are but visitors from the Arctic tends to increase the difficulty, there is none of the familiar acquaintance produced by resident or breeding-birds. The observer has but painfully grasped the advent of a certain species before it is gone again, and he is inclined to doubt his own notes and deductions. It is a consolation to me that even Hudson does not find much to say in certain cases, and is curt in consequence.

Both Claude Grant and I chronicle the Pectoral Sandpiper in the Ajó district between the dates of 11 September and 19 March. I have no record of large gatherings, only small flocks up to half-a-dozen, or single birds. It has a swift Plover-like run on the ground. The flight is quick, with very rapid movements of the wings, and erratic, similar to that of a Snipe. The note when rising or on the wing is soft and oft-repeated.

The iris I have sometimes noted as light yellow, at other times dark brown; bill yellow at base, merging into dark brown or black; feet varying from pale or greenish yellow to dark olive, with black claws.

400. **Tringa bairdi** Coues. Baird's Sandpiper.

Hudson dismisses this species in three brief lines. Claude Grant procured but two specimens in the Ajó district, on 22 November, 1908 and 19 December, 1909, respectively; and adds that it is "not nearly so common as the following species (*Tringa canutus*), with which it usually consorts." In view of what he states regarding the latter species when he comes to deal with it, it is not surprising that my own record, so far as Baird's Sandpiper is concerned, should be an utter blank.

Tringa canutus Sharpe, Cat. B. xxiv. p. 593.

Hudson is altogether silent on the subject of this species; but Claude Grant obtained various specimens at Cape San Antonio on 19 December, 1908, and writes as follows: "These specimens are in moult and have almost assumed the adult winter dress, but have not yet lost the wing-coverts of the young plumage." And he adds "Two or three parties of Knots, comprising eight or ten individuals, were observed on the sea-shore at Cape San Antonio. This appears to be a new record for Argentina, but is not unexpected, perhaps, as the bird has been traced as far south as Brazil."

401. **Tringa fuscicollis** Vieill. Bonaparte's Sandpiper.

The bill is olive-coloured with a black tip, or sometimes entirely black; legs and feet equally variable, greenish yellow, very dark grey or dark olive (almost black); claws black.

This is certainly our commonest Wader, and is found everywhere in flocks, from say the end of October to the middle or end of March. The number in these gatherings is only restricted by the area of the feeding-ground; hence, when large mud-flats are available in the vicinity of our fresh- or salt-water lagunas and cangrejales, or at the subsidence of a flood, the flocks are sometimes of enormous size. The observer may see many acres of ground which look to be in continuous movement, the surface being alive with the restless throng of Sandpipers running about and chasing each other, feeding, or taking constant short flights. And it is then that he is tempted to exclaim "Oh, that the crowd would only be still for five minutes, and allow me to resolve so much Sandpiper into their relative species!"

402. **Calidris arenaria** Linn. Sanderling.

As regards the connection of the Sanderling with our locality I am utterly dissatisfied with my own notes on the species; and prefer to quote solely Claude Grant, who states that "it was commonly observed during the summer months along the coast in the Ajó district in flocks of from six to twelve individuals."

403. **Totanus melanoleucus** Gm. Greater Yellowshank.

Iris dark brown; bill dark brown at base, merging into black; feet yellow or bright yellow, claws black.

This and the Lesser Yellowshank so closely resemble each other in every point except that of size, that, unless the two species happen to be feeding in juxtaposition, the observer has considerable difficulty in determining which of them he has in view.

The Greater Yellowshank is to be found all the year round; singly, or more often in pairs. Only once does my diary refer to larger numbers, when (at the end of September 1913) I observed numerous large flocks towards the mouth of one of the great drainage canals where it debouched into the Bay of Sanborombon. It is generally distributed and equally at home on the freshwater marshes or the salt lagunas and cangrejales; not so abundant as its smaller congener, it is frequently found in association with the latter. An exception to the said custom was when on 3 November, 1915, I navigated the canal between Ajó and Santo Domingo and found only *melanoleucus* on the first half of the day's journey, to be replaced entirely by *flavipes* later on. The most of the former were in ones and twos, the latter in numerous large flocks.

Mr. Hudson's remarks on a double migration are doubtless correct, as it is always in evidence with us, and yet is not known to breed. Those individuals I have shot in February and March were exceedingly fat, and were presumably prepared for their northern journey.

The Greater Yellowshank is a handsome and interesting Wader, familiar to all denizens of the pampas. Its bold and alert attitude catches the observer's eye as he approaches the pool or marsh where it is feeding; and the strong and musical alarm cry is repeated in warning until the intruder forces it to take refuge in flight with a last parting note or two.

404. **Totanus flavipes** Gm. Lesser Yellowshank.

Iris dark brown; bill at times dark olive at base, with black tip, in others entirely black; claws black.

My own notes correspond with those of Mr. Hudson to the effect that whilst not entirely absent throughout the year, it is much scarcer during the winter months. Speaking generally, it is more abundant than *Totanus melanoleucus*; and if often seen singly or in pairs occasionally increases to small flocks, which is very unusual with the larger species. At the beginning of the great flood in 1913, I particularly note (on 30 October) that I have seen absolutely none on all my previous journeys between Ajó and Buenos Ayres, etc., and three days later it makes its appearance "in great numbers, large flocks, on mud-flats near Yngleses head-station," after which it becomes generally distributed.

In flight, habits, and note, *Totanus flavipes* resembles *Totanus melanoleucus*—all on a similar scale, be it understood.

Micropalama himantopus Sharpe, Cat. B. xxiv. p. 401.

Iris dark brown; bill black; feet olive-colour, claws black.

Claude Grant collected this species at the Yngleses on the 24th of February, 1909, and adds the following note: "This little Wader has much the same actions as the Curlew Sandpiper (*Tringa subarquata*), for which species I at first mistook it. Like that bird it wades deep into the water—in fact, until the water flows over the back of its neck."

The following is my one and only entry of a reliable nature and is taken from my Skin-book, under date 27 December, 1913: "Shot out of a flock of over 100, might easily have been 200, so closely were they massed. Were feeding on marshy ground near head-station; and as the flock rose at my approach, circled and passed away, the white under surfaces were quite dazzling in the sunlight."

408. **Limosa hæmastica** Linn. Hudsonian Godwit.

Iris dark brown; bill a faint mauve or lilac-brown at base, tip black: feet very dark grey, or black.

The Hudsonian Godwit occurs with us all the year round, the months of January and February practically excepted, when my journal is a blank. In midwinter (2nd July) at the Laguna Palenque I have found it "Very abundant, in numerous flocks, some of apparently over 1000, no less." And in the same locality at the beginning of summer (6 December) in a subsequent year, I note: "A large flock of from 150 to 200." Claude Grant collected young on 1 November (Los Yngleses) and an adult on 20 December (Cape San Antonio). The preceding may tend to confirm Mr. Hudson's theory that it is both an Arctic and Antarctic species, breeding towards each of the Polar circles, but meeting to winter in the temperate zone of the southern hemisphere (*vide* 'Argentine Ornithology,' vol. ii. p. 191). Personally, I do not venture to give an opinion; but, whilst in some years it has been of general occurrence (with the exception of the two months I have mentioned), many others furnish no entries for my diary whatever; and I am led to wonder at the cause of the irregularity, and why both north and south should fail us completely throughout these seasons.

I have alluded to the very large flocks which are sometimes to be found at the Lagunas Palenque and Milan; and on more than one of these occasions several birds have dropped to my gun. The flock would then again and again sweep round and hover over the individuals in the water, uttering loud cries of distress, quite regardless of my presence in the open and the renewed gunfire. Though the Godwit is such an excellent table bird, I found myself unable to continue the slaughter under these circumstances. I might select my birds, but so closely were they packed together that the shots went practically "into the brown," and caused innumerable cripples.

409. **Numenius borealis** Forst. Esquimo Whimbrel.

Mr. Hudson writes of this species as if he had no personal knowledge of it, and accordingly only quotes other observers. Claude Grant makes no allusion to it at all in connection with his two visits to the Ajó district. Formerly, I used to observe it occasionally and irregularly as a brief visitor at the height of summer or the beginning of autumn. Rarely seen alone, it was generally associated with the American Golden or other Plovers, frequenting certain localities where the plains were most open, bare, and dry; and exceedingly wild, even where horsemen were concerned. The last few entries in my diary are as follows: "13th February, 1899. Must have seen some twenty or thirty Whimbrel in vicinity of Linconia, associated with Golden and other Plovers (all these had disappeared from the locality by the 20th of the same month)." "8th April, 1901. Mr. M. A. Runnacles reported a small flock, seen only for one day, in vicinity of Linconia. And on the 16th of that month, a few were observed in the Palenque district."

I am prolix to the above extent, but advisedly so; for, even making allowance for my own frequent absences from the Yngleses since the year 1901, I was beginning to be exercised as to the non-recurrence of the species, as judged by the long silence in my diary. And my growing fear that I have witnessed the passing of the Esquimo Whimbrel (so far at least as this locality is concerned) has been confirmed by the following article on the subject ('The Ibis,' Tenth Series, vol. v. No. 4, p. 630, October 1917), which I crave the Editor's indulgence for quoting at length:—

"SWENK ON THE ESKIMO CURLEW.

"[The Eskimo Curlew and its disappearance. By Myron H. Swenk. Smithsonian Report for 1915, 1916, pp. 325-340; 1 pl.].

"It appears likely that the Eskimo Curlew (*Numenius borealis*) will shortly share the fate of the Passenger Pigeon and the Great Auk and disappear entirely from our living avifauna. First described by Forster from Hudson's Bay in 1772, the Eskimo Curlew breeds in the Barren Grounds of Mackenzie in the arctic regions of North America, and has a very remarkable migration route to and from Argentina—its winter home.

"In the spring migration these birds pass north through the Mississippi valley, rarely if ever occurring on the Atlantic coasts. After the breeding-season is finished, late in July or early in August, they move south-eastwards to Labrador, Newfoundland, and Nova Scotia, whence they pass across 2000 miles of ocean, direct to the Lesser Antilles and thence down the Brazilian coasts to their winter home. It is only occasionally after a heavy gale that some birds reach the New England coasts, while a few have rarely been driven by westerly gales as far as the coasts of the British Isles.

"During the past few years, however, the Eskimo Curlew, formerly arriving in immense flocks in the middle prairie States in the spring, has become rarer and rarer. The last record for Kansas is 1902 and for Wisconsin 1899, while in Nebraska, of which Mr. Swenk writes at great length, a flock of six or seven were seen in 1913 and a single bird was killed on 17 April, 1915. The bird is probably not yet extinct, but is on the high road to extinction, and will doubtless become so in a few years' time."

It will be seen from the preceding how closely Mr. Swenk's notes and my own data in the far south approximate, and the fatal deduction they lead to.

410. **Rhynchops melanura** Sw. Black-tailed Skimmer.

Iris dark brown ; bill either red or orange at base, remainder black ; feet bright red or a light brick-red.

The Black-tailed Skimmer may perhaps not breed in our locality, as judged by Claude Grant, who considers it only a winter visitor. And I myself have no knowledge of its doing so. But the mud-flats and sand-banks of our Rincones are numerous ; whilst that district is a No Man's Land, and of great extent. And I am moved to further entertain the possibility by the fact that I have observed the species in nearly every month of the year, particularly at such a time as the middle of September in two different seasons (a pair and a small flock of eight respectively), when on a similar date Claude Grant found various colonies nesting on the River Paraguay. Again, Hudson gives its chief breeding-ground as being the mud-banks and islets at Bahia Blanca, far south of here, and on the Atlantic seaboard. Am I to suppose, then, that these September birds of mine had not yet made their way to the above-mentioned far-away localities, or that they had found a suitable site with us? The same query attaches itself to a flock of over two hundred, seen resting on a mud-flat on the Ajó river (above the little town) when I travelled that route by launch on the 3rd of November, 1915.

Darwin's account of the Skimmer or Scissor-bill (as quoted in 'Argentine Ornithology') shows the impression this extraordinary bird made on him at first acquaintance. Similarly, I recollect my own astonishment when on the 30th of August, 1875 (not having then read 'The Voyage of the Beagle'), I met a solitary specimen towards the evening, at what we designated the "Estancia cañada pass." It was quartering a large stretch of open water, and was being persecuted at the time by various Lapwings, which its swiftness of flight and agility in turning set utterly at naught.

Whenever a moment's respite was gained it skimmed along the surface of the water for about twenty yards with a third of its bill immersed; then rose, circled once or twice, and repeated the surface-glide. For a long time, fascinated, I watched the dexterous and imperceptible use of wings and tail, the reflection of the bird in the calm sunset-tinted pool, and the tiny furrow ploughed by its bill. And it was almost dark when I rode away and left the Skimmer and its shadow still coming and going in the dusk.

I have taken a fish, two and a half inches long, out of the crop of one of these birds; but I have never actually been close enough to detect any movement or closing of the mandibles, nothing but the lower one cutting its "lonely furrow."

The note is loud and harsh, but not uttered whilst fishing, only when rising from the surface of the water, or if a flock is disturbed whilst resting on the bank of a laguna.

412. **Sterna maxima** Bodd. Great Tern.

Iris very dark brown; bill orange; legs and feet black.

Hudson evidently never met with the Great Tern. And if (as he states) it occurs on the Rio Parana, according to Azara, it so happens that Claude Grant did not meet with it there, along with other species of Terns. The last-named, however, places it to the credit of Ajó as follows:—"During the week including the 1st of March (1910) several of these Terns were seen, sometimes singly and sometimes in pairs, passing along the Atlantic coast, but generally very far out at sea. I had not met with this species in the Ajó district before. It has a very clear, shrill cry, which cannot be mistaken."

It is curious that my one and only encounter with this species should have taken place about the same date (13th March) of 1905, and under similar circumstances. Happening to be down at Cape San Antonio, I noticed a flock of between ten and twenty resting on a sandbank in company with some Gulls and Trudeau's Terns; and had just time to disengage my gun and cartridges from the carriage following me, and get into a favourable position, when the flock rose and came towards me, fortunately inland. I secured three specimens (females all), and these are now in the British Museum. The cry, though not loud, was sharp and short, and, as Claude Grant says, unmistakeable. When a wounded bird fell into the water, however, it (and those hovering over it) uttered a louder and completely different note. The food in the crop consisted of small fish, which Agustin Bisso, a local fisherman of twenty years' standing, who professed to know the species well, told me it procured by diving from a considerable height.

It has often been my custom to visit the sea-coast, and at various periods I have stayed at Cape San Antonio, but the above is the only occasion when the Great Tern has come within my ken.

413. **Sterna trudeauii** Aud. Trudeau's Tern.

I am surprised that Mr. Hudson has so little to say about this beautiful and common Tern; for, as Claude Grant remarks, it is to be met with on every large lagoon and open sheet of water inland, as well as the coast. It is true the last-named writer is referring especially to the Ajó district, where the species is resident; but I myself know it familiarly, on my journeys between Ajó and Buenos Ayres, on rivers, lagoons, and swamps.

There is little of particular interest to extract from the many perfunctory entries in my diary, extending over so many years. Except when congregated in nesting-colonies, Trudeau's Tern is generally seen singly or in pairs. The larger lagunas, such as those of Milan and Palenque, are naturally more frequented, but by nothing in the nature of the large flocks which Claude Grant mentions as a daily feature of the sea-coast.

The note is a strident cry, most in evidence when the nest is in danger. On these occasions the parent birds become very bold and threatening; indeed I was once struck on the head three times in rapid succession by the same individual, the last blow being distinctly unpleasant. That this Tern should *perch*, as Gulls frequently do, is so unusual that I took special note of the fact when I saw three on a wire-fence in a sea of water.

Eighteen years had passed before I found my first breeding-colony (in 1890), since which time I have noted only other five. The periods vary from 26 October to 5 January. As a rule, the Terns were associated with the Spot-winged Gull (*Larus maculipennis* Licht.); two exceptions consisted of small groups of three and ten pairs respectively. In the other four cases the number of pairs ranged from half-a-dozen up to perhaps forty, and the nests were interspersed with those of the Gulls, sometimes closely situated, at others widely scattered. The localities seemed capriciously selected, being either of a lonely nature or one liable to be molested by passers-by: a matter of caprice, in short. As the situation was always of an open nature (a large expanse of water covered by weeds and generally at the side of a swamp) it was open to detection from a long way off. The nest seemed to differ in construction according to circumstances, but the material was always soaking-wet water-weeds, and floating in a bed of the same. Occasionally it would be a slovenly platform; other colonies presented a small, round, and neat type, with a more or less pronounced hollow, and measuring two inches high by nine across at base and four or five at top.

The usual full clutch consists of three, but four is not uncommon. The eggs are generally oval in shape, often elongated, and sometimes pear-shaped; in fact they are rather irregular. In some cases the ground-colour is olivaceous, in others brown or yellowish brown, and is spotted and blotched with dark ash-grey, dark brown and black, or strong dark red-brown markings and (under the surface) dull lilac spots and blotches. Each clutch presents its own characteristics, whilst leaning towards one of the half-dozen general types into which it is found that a large series divides itself.

The average measurement is 43 × 31 mm. That of the largest clutch 44 × 31 mm., and the smallest 41 × 29 mm.

415. **Sterna superciliaris** Vieill. Eyebrowed Tern.

Iris dark brown; bill bright yellow; legs and feet olive-yellow, claws black.

Claude Grant found this species abundant on the Rio Paraguay, and breeding, but makes no mention of it in connection with Ajó and Cape San Antonio.

I have only once seen it in our locality, when, on 4 May, 1902, I secured a specimen (now in the Dresden Museum) at the Laguna Milan. The flight was of the usual Tern description; and the bird (a female) showed the family indifference to the presence of human beings by returning immediately to the spot after being fired at once. It uttered no note or cry, either when on the wing or when it fell wounded in the water. A curious incident was the subsequent appearance on the scene, an hour or two later, of another individual of the same species. The second bird seemed wilder, and decamped after an ineffective shot. Without doubt they must have been a pair, though they were not seen together.

Gelochelidon anglica Saunders, Cat. B. xxv. p. 25.

This species does not seem to have been known to Hudson, and I myself am totally ignorant of it. Claude Grant's remarks, therefore, regarding its connection with the Ajó district, are doubly interesting to me ('Ibis,' July 1911, p. 474), and I have promised myself to devote further attention to its winter visits should the opportunity arise. That he should have seen various individuals about the same date on two successive seasons proves that its presence was not entirely fortuitous, whilst its restriction to certain tidal waters on the northern part of the Yngleses, helps to explain my failure to notice what he alludes to as a "Tern distinguishable from every other by the black bill, which is very striking."

416. **Larus dominicanus** Licht. Dominican Gull.

This handsome bird is resident in our locality, where it also breeds. Perhaps owing to our close proximity to the coast, I have found it wandering inland during the summer months, as well as in the cold season. On these occasions the number was small; so much so that when the attraction of carrion drew together as many as a dozen, I was much impressed by the fact. Even in the old days, when our private "Graseria" (sheep boiling-down establishment) was in operation for two or three months at a time, "perfuming the circumambient atmosphere," and the corresponding amount of offal drew together immense numbers of the Cayenne Ibis, the Carancho and Chimango, and both the smaller Laridæ (*cirrhocephalus* and *maculipennis*), the Dominican Gull never exceeded perhaps a score. The most attractive bait in the shape of carrion for this species is a dead horse or mare, after the hide has been taken off. A cow or sheep *may* possibly draw one or two individuals, along with the other birds mentioned above; but the carcass of the equine quadruped, especially if very fat, is a certain rendezvous for a pair or even a dozen of the Dominican Gull. These remain in possession for various days (possibly a week), keeping at a respectful distance all other would-be partakers of the feast (though I have known them held off in their turn by the Chilian Sea-Eagle), and only withdraw at dusk to some open pool in the vicinity, where they would seem to pass the night. The proximity of the carcass to a human habitation seems a matter of indifference, and has no deterrent effect, though at other times I do not think I would call it a confiding bird; it might best be described as both bold and wild, not afraid of man, but contemptuous of him and all his works—a creature of the stormy and lonely seas, and of the solitary plains.

The cries also are typical of the species, clamour of long hoarse calls to each other, loud chorus of inhuman laughter as they wrangle over their feast, and a high and sad double-note recalling great oceans and wandering sea-fowl. *Sui generis*! Who does not recall similarly the Curlew's note by shore or moor, and the memory of the environs it always brings back to him?

I once reared and kept a young bird for a couple of years at the head-station—in the patio. And I think "Pio-pio," as he was called, was possessed of seven devils. Pet lambs he scarified till they had to be removed from his unholy vicinity; cats and dogs went in terror of their lives; human beings he ignored, if left to himself, but it needed only the challenging call of "Pio-pio" to him, wherever he happened to be—standing about one of the kitchen-doors, on the verandah, or elsewhere in the patio—and down-and-out (snake-like) would go his head, as with an answering cry of "Pio-pio," and at a swift run, he would make straight for the foe. It was well then to be in riding-boots; the strength of his bill was only equalised by the ferocity of his assaults, each cut or thrust being accompanied by the high shrill "Pio-pio." And when he remained alone, in victorious possession of the battle-field, the head was directed straight upwards, the bill opened to its full extent, and a great and prolonged metallic note expressed his triumph.

Mr. M. A. Runnacles informed me that in 1912 a large colony of this species had nested in the vicinity of the Laguna Milan; but I believe the circumstances had been favourable for the one season alone, and that the birds did not return in after-years. The colony with which I am familiar (near Cape San Antonio), and of which I first made the acquaintance in 1885, had then been in existence for an indefinite period, and may still be so for aught I know. It was situated on a great mud-flat, in the heart of the Tuyu Rincones (for that Estancia has also its share of these delectable waste-lands); no quadruped could approach the site, guarded as it was on each side by an impassable cangrejal or tidal creek, only to be negotiated on foot or by boat; and even the low flat itself, honeycombed by crabs and with some patches of Salicornia growing upon it, was of the kind only capable of bearing my weight on the crust with difficulty. Altogether a most lonely locality, amidst jungles of pampa and other giant grasses; a few copses and strips of stunted tala trees some miles inland, and the Tuyu head-station woods a blue line on the far horizon (those of the Yngleses over the edge of the world altogether); sandy dunes of the Atlantic on the one hand and the equally unfrequented La Plata estuary on the other, and not a living thing in sight, except the wild, clamouring Gulls and the myriads of those uncanny crabs. I remember it was a dull, windy day, cold and grey, as I surveyed the situation preparatory to dismounting; and my peon emphatically declined the suggestion that he should hobble both the horses and accompany me. "Not if you were to pay me, Don Ernesto! And also, who is to throw the lasso if you happen to get stuck in that cangrejal?" Then, as he saw me stripping: "For the love of God, patrón, take care you do not step upon a Vivora de la Cruz amongst the pampa grass." The last reminder did not fail to make me somewhat uncomfortable, for that very nasty pit-viper has its home in the Rincones (though I have never known it to be met with on our inland camp). Such another experience was in my mind, the occasion when I poached (as a boy) a Black-headed Gulls' colony in Stirlingshire: a bitterly cold day, and the dismal pools and treacherous bog set in a bleak moor, whilst a possible gamekeeper might have taken the place of the snake.

On this date (20 October) there were about fifty pairs of nesting-birds. Many of the eggs were much incubated, and some young hatched out. The nests were placed at varying distances apart: sometimes being mere hollows in the clay; at others, placed amongst the tufts of Salicornia, a rough bedding of the same or of dry weeds. All the eggs, whether fresh or otherwise, were quite unrecognisable from the coating of grey cangrejal clay. The general clutch was two, rarely three (no nest contained more than two young).

The eggs are rather round in shape. Ground-colour yellowish brown, spotted and blotched with ash-grey, dull lilac, and a dark red-brown tending towards black. As a rule, these markings are more pronounced and more numerous towards the blunt end; but I have a specimen in which the smaller end is so favoured. Taken as a whole, they are rather dull-looking, as if they responded rather to their surroundings than the parent-birds' bold coloration.

The average measurement is 73 × 51 mm.

417. **Larus maculipennis** Licht. Spot-winged Gull.

Iris brown or dark brown, as distinguished from the yellow or pale straw-colour of *Larus cirrhocephalus*.

Mr. Hudson has given such a full and detailed account of the habits of this dark-hooded Gull as to leave me little to add. Sometimes the species is found alone, but more generally it is associated with the Grey-capped Gull (*L. cirrhocephalus* Vieill.). From the numerous entries in my journal I can deduct no general principle which would seem to explain these circumstances.

Once I saw an individual seize and carry off from its nest a young waterhen, a procedure which struck me as out of place and highly reprehensible, as I supposed the species to be non-predatory. The other extreme is conveyed in the following curious note, dated 9th November, 1899:—"Observed a flock of about fifty Gulls (all of which were *L. maculipennis*) assembled in the open camp around an ants'-nest (of the large black kind), the denizens of which were in the winged state. The Gulls either alighted on the ground in their pursuit, or hawked them in the air."

The Spot-winged Gull nests with us between the end of October and the beginning of January, in company with Trudeau's Tern. As mentioned when writing of the latter species, eighteen years had passed before I discovered my first colony of Terns (in 1890), and consequently that of the Gulls. Since then only some four or five others have come under my notice, and these at long intervals. I have never known the birds revert to a former site. The situation has been described in the notice of the Tern; not necessarily in an out-of-the-way place or fastness, but often in a noticeable locality. Open, and comparatively shallow, water is preferred, sometimes on the verge of a rush-bed. None of the colonies exceeded a hundred pairs, some being only half that number. The nests might be closely placed or widely scattered, according to the nature of the site. As a rule they are mere floating piles of wet water-weeds, in beds of the same; but I have known them built of dry junco-stems, slight and shallow, and lined with a little dry water-grass.

Possibly Hudson has made an involuntary error when he places the number of eggs at four; I have never known the clutch to exceed three. They are large for the size of the bird and obtusely pointed. The ground-colour varies, passing from clay to yellowish and olive, and then to various shades of brown. The markings are just as different in individual clutches, ranging through violaceous and reddish-brown freckles and streaks to spots and blotches of dark ash-colour, brown and dark brown, and finally merging into black. As a rule these markings are fairly well distributed over all the surface, though there is a tendency for them to increase in number and heaviness towards the blunt end. A large series presents a great variety of colouring, but readily falls into a general classification of five or six types.

The average measurement is 52 × 37 mm., the largest clutch being 52 × 38 mm., and the smallest 50 × 36 mm.

418. **Larus cirrhocephalus** Vieill. Grey-capped Gull.

Iris yellow or pale straw-colour, as distinguished from the brown or dark brown of *L. maculipennis.*

When the mystery of the Grey-capped Gull's breeding-locality is cleared up, its previous and subsequent movements throughout the year may be more readily followed. At present it would seem as if that secret is locked up in some of the Patagonian lakes, similarly to the description given of the same species in British East Africa (*vide* 'The Ibis,' vol. iv. p. 194, April 1916). I should much like to see the mystery solved, and the home of this beautiful and interesting Gull fully established.

In the meantime I am satisfied to accept Claude Grant's dictum as follows:—"The Grey-headed Gull makes its appearance in the Ajó district after the breeding-season and remains throughout the winter, consorting with *L. maculipennis* in flocks of thousands and feeding largely on the carcases of dead stock. It can be picked out from *L. maculipennis* by its larger size and darker colouring, and the call is also louder and harsher."

Stercorarius crepidatus Saunders, Cat. B. xxv. p. 327.

Claude Grant has not only established this Skua as a visitor to our district, but possibly adds a record for Argentina. He secured a specimen on the coast on 21 February, 1909; and exactly a year subsequently saw two other individuals close to the same spot ('Ibis,' July 1911, p. 476).

419. **Æchmophorus major** Bodd. Great Grebe.

Adult. Iris dark brown (occasionally yellow); bill dark horn-colour, almost black; feet grey, mottled with black.

Immature. Eye black; bill pale yellow, dark on culmen; front of feet yellow, back of same, and the soles, black.

Nestling. Eye black; bill grey, tip black; feet grey, mottled with black. On the top and centre of head is a bare yellow patch of soft skin.

Though, as Mr. Hudson remarks, "there is little diversity in the habits of Grebes," yet, as it is a long time since I wrote about this particular species, there is nothing lost in speaking of its general life-history.

I am aware of the fact he makes special allusion to, "that it is now much sought after on account of the beauty of its plumage." And I should imagine that on the Parana delta, for example, it is becoming rarer. Here, however, there has arisen no demand for its skin, the plume-hunter having confined himself to the pursuit of the two species of Egrets, and accordingly no diminution in its numbers has taken place. Single birds, or more generally pairs, may be found in every locality; the swamps, lagunas, and tidal creeks, and even the salt-water at Cape San Antonio seem congenial to its everyday life. So late as 3 November, 1915, on the large drainage-canal between Ajó and Santo Domingo, I observed a large number, particularly near the former town. This and the Cormorant were the two species which afforded me most amusement as my nafta-launch hustled them all that day.

On the 13th of December, 1898, I happened to shoot a female, and with it secured a young one, which it was carrying on its back or hidden below the wing (there being a kind of natural pouch or hollow for that purpose, situated below each wing); when the parent-bird dived the young one separated itself and remained afloat. The cry of the adult resembled that of the Peacock, though naturally not so powerful, whilst the young had but a feeble note. Under the title of "nestling," I have described the bare parts of the chick. When placed upon the ground (while it bit me savagely), it sat with its head and neck erect, the body resting on the ground, and the feet stretched out behind; these it used for progression, propelling itself along with them in a succession of frog-like jumps.

In my former paper I described three nests, all taken very early in the season, namely, the last week of August (1877); these, I recollect, were all situated in the same locality, in the deep and central part of a swamp; were built of wet water-weeds (which the sitting-bird hurriedly drew over the eggs on leaving the nest at my approach), and contained two clutches of three and one of two eggs respectively. There is no further entry in my diary until 1898, when I chronicled four nests between 14th and 20th of December: these in position and materials were very similar to the previous lot; were again in two groups of two each, while the sitting-birds (one of which was a male) showed the same solicitude in covering-up the eggs. Of the clutches, all much-incubated, two this time were of four eggs, the other two of three respectively. Since the last-named year, I have met with no further nests; but I would premise that they are difficult of approach in a canoe, owing to the density of "durasnillos" and "juncos," and equally awkward on horseback for the same reason, in addition to the deep and muddy nature of the position selected.

The eggs average 56 × 37 mm.

420. **Podiceps caliparæus** Less. Bright-cheeked Grebe.

Adult male and female (3 March, 1899). Iris scarlet; bill entirely plumbeous; feet olive-grey, those of female somewhat yellower.

Young (brood of above), *male and two females*. Bill also plumbeous, slightly darker in the male; feet similarly olive-grey.

Hudson rightly alludes to this species as a beautiful Grebe, and had he known it personally, and been in a position to add to his description the brilliant scarlet eyes and plumbeous bill in juxtaposition with the golden ear-coverts and strong coloration of the head and neck, his praise would have been further justified.

The Bright-cheeked Grebe is, I think, resident all the year round in our district, but not common. Until I revised my diary I was under a different impression, and this conclusion must have been arrived at from two reasons—the striking individuality of the species and the fact that it is peculiarly local. Year after year, at one season or another, I was sure to see a pair or a small flock (parents and brood?) at certain lagunas or open water-spaces of our largest cañadones; these particular localities not being more than two or three in number.

I have no reference in my journal to any note or cry.

Of its breeding-habits I am in ignorance. The nearest approach is that of the brood referred to at the beginning of this notice. I had shot the two adults in the open part of a deep cañada, and, the spot being a good one, was again on the watch in a canoe a couple of days subsequently, when, to my surprise, the three young birds came out of the rushes singly and at long intervals, and were duly secured.

Podiceps americanus Garn.

Iris crimson or claret-colour, pupil black; bill dark brown or horn-colour above, lighter below; feet olive-grey or dark grey. Both sexes the same.

This is the species which I erroneously described in my former paper as *Podiceps rollandi* Quoy et Gaim. (Rolland's Grebe). The latter would seem to be totally unconnected with this district.

My former notes hold good otherwise and require little amplification. Abundant and generally distributed, it is a familiar and interesting member of the Grebe family, especially on the larger lagunas, where one may frequently see the family-group of six or seven individuals. A most unusual gathering was that described to me by my collector, F. Roldan, who, on 8 March, 1899, killed six with one shot out of a flock of about a hundred (adults and immature), on a stretch of open water about half-a-mile long and seventy yards wide, situated in the neighbouring Tuyu estancia. The following summer my diary quotes the species as being "incredibly abundant."

Further breeding-notes extend the nesting-period largely, through October and November. Three dates are still later—14 December, 10 January, and 8 February. The species may possibly have two broods in the course of the season, or it may be that my collector in each case had despoiled the first nest earlier in the spring. The full clutch of eggs is six or seven, the latter being frequent; but I do not recollect having seen more than five young accompanying the parent birds.

Fresh measurements of the eggs corroborate those given previously—an average, say, of 44 × 31 mm., with considerable variation in different clutches and individual cases.

422. **Tachybaptes dominicus** Linn. American Dabchick.

Male and female. Iris dark brown, pupil black; bill, upper mandible dark brown, base and lower mandible yellowish; feet olive; those of the male more yellow in tinge.

The above pair, shot on 13 December, 1898, were identified by Dr. Berg as being of this species, and they now repose in the Buenos Ayres Museum.

I have only one other record of its occurrence when, on 25 February, 1900, a pair with young came under my observation.

423. **Podilymbus podiceps** Linn. Thick-billed Grebe.

Adult male and female. Iris dark brown, in some cases with a white ring round the eye; bill generally plumbeous, at other times pale grey or nearly white, with grey culmen, and crossed with a black band; the feet vary from grey to dark olive-grey, and grey mottled with black, or a slate-colour, almost bluish grey.

Young. Iris dark brown; gape and nasal spot magenta; bill blackish, with a few white markings; feet dark grey, with white markings.

Mr. Hudson does not seem to have made the personal acquaintance of this rather sturdy-looking Grebe, and evidently considers it a rarity in the Argentine Republic. I myself did not observe the species until after twelve years' residence, when, on 16 November, 1884, I secured a pair with their four young. I was much struck at the time with the loud clear call of the parents, to which the young responded from amidst the rushes, with a similar but weaker note. No less than fourteen years passed again before the species came under my observation, when, in 1898 and 1899, I secured various individuals, adult and young. In 1902 and 1904 I was similarly fortunate. Subsequently, until 1913, I was often absent from the locality, except for winter visits. In the last-named year I took my first and only nest with eggs. The last entry in my journal is dated 3 November, 1915, when, on the great drainage-canal between Ajó and Santo Domingo, I noted no less than ten individuals, all singly.

It would appear that the Thick-billed Grebe is a summer visitant, all my notes being entered between the middle of September and the first week in March; also that it favours exceptionally wet seasons. Generally shy in its habits, it is to be found in the deeper and more secluded rush-beds, and hence it is difficult to observe and secure. Nevertheless I have known of a pair in quite open water in company with the large gathering of *Podiceps americanus* alluded to in my notes on that species. In a similar case, when I surprised an individual in an open rushless channel, it first dived, then rose and flew a hundred yards, and dived again into the security of a laguna. Those I saw on the canal, at the approach of my launch at once took shelter in the dense bordering rush-coverts. Finally, there is an entry in my journal, where I refer, in a tone of exasperation, to a male bird which kept in such close proximity to my canoe, motionless amidst the "juncos," that it was some time before I could shoot it in cold blood without blowing it to pieces. Moved doubtless by curiosity, it would rise to the surface, survey me silently for a moment, then dive and reappear similarly in another quarter.

The call-note, of both adults and young, I have already described.

That the species bred here, I was of course aware, from having seen or secured young birds along with their parents; but its general scarcity, combined with the nature of its haunts, rendered the discovery of an authentic nest rather a hopeless prospect. It was therefore with great interest that, in the spring of 1913, I observed an individual in such a favourable and isolated locality as the large "Charco" or pond with its rush-beds, situated in the head-station woods. Only the female was observed at any time (no other Grebes were present), and she was very shy, keeping at some distance and diving at the slightest alarm. I shot her on the 16th of November when I took the nest with seven slightly-incubated eggs. (Said bird had the iris very dark brown, with a white ring round the eye; bill whitish, with a tendency to bluish grey; crossed over nostrils and both mandibles with a strong black band; feet very dark grey, or a slate-colour which was almost bluish black.)

The nest was not hidden in the rushes, but in rather an open space amidst water-weeds; a floating, mucky, black pile of water-weeds of different kinds, some 3 inches high and about 14 inches across at base, whilst the hollow on the top was 5 inches across. The eggs were completely covered with wet weeds.

This lot of seven eggs is undoubtedly a full clutch, though the few broods which have come under my notice did not exceed four in number. I find a pencil slip in my journal (unfortunately without reference to authority) which says:— "Pied-billed Grebe (*Podilymbus podiceps*). Buffalo Lake, Province of Alberta, Canada, 2 June, 1914. Nest with seven eggs." Señor Roberto Dabbene puts the number at four or five (Anales del Museo Nacional de Historia Natural de Buenos Aires, tomo xxviii., p. 192). Curiously enough, the measurements he gives are 42–44 × 30–32 mm., which approximately are those of *Podiceps americanus*, whilst mine are 45–48 × 32–33 mm., or an average of 47 × 32 mm. We are both agreed as to the shape:—"Elliptic, with the two poles almost equal."

Catarrhactes chrysocome (Cat. B. xxvi. p. 365).

As Hudson remarks, Penguins are well known to the Gauchos along the coast; but more, I take it, from dead than living examples. I myself have never seen one in the flesh, defunct or otherwise.

A very interesting dead specimen (an immature individual) of this species was found by Mr. M. A. Runnacles on our sea-coast in July of 1914. He was good enough to carefully skin it and give it to me. In my turn I presented it to the British Museum, where Mr. Charles Chubb duly identified and welcomed the specimen, remarking that its occurrence was of great interest.

427. **Rhynchotus rufescens** Temm. Great Tinamou.

Ever since I came to this locality I have known of the "Perdiz Grande" as a species entirely confined to the Rincones, and, in a lesser degree, to the Atlantic coast-belt. Formerly, on these occasions when I penetrated into our Rincon Grande, I was always prepared for the sudden and very startling flight of this handsome Tinamou, and might count upon seeing two or three individuals. On the rough and lonely sand-dunes of the coast it was much scarcer, except perhaps in the immediate vicinity of Cape San Antonio, where the Rincon and coast formations come into juxtaposition. As a denizen of the "camp" proper it had long ceased to be, with the replacement of the pampa and other giant grasses by finer pastures (indigenous, not imported from Europe, as has been stated). From all I can learn the local situation remains unchanged at the present date—a few pairs maintaining their little-disturbed existence in the localities referred to. The largest number I have encountered in the Rincones in one day in the old times (1876) has been five—two pairs and a single bird. The next entry in my journal refers to how a cousin of mine, shooting in the Tapalque district (not far from Azul), had to his own gun in one forenoon, "the day being misty and the scent lying well for his very good dog," no less than thirty-seven birds.

I have occasionally seen nests with broken shells, but have never taken a clutch of eggs. A single (and much incubated) egg was once brought to me on the 25th of January.

430. **Nothura maculosa** Temm. Spotted Tinamou.

Iris hazel or reddish; bill, tip and culmen dark brown, almost black; gape and under mandible whitish; feet greyish yellow or yellowish brown, with occasionally a pink tinge, which disappears after death.

To my former notes, and Hudson's more full account, I have but little to add. The species is still less abundant locally than when I wrote of it in 1880. And even then I was in a position to judge of its diminishing numbers; for I have always retained a vivid recollection of an incident about the year 1860, when I was a mere child, of a large trayful of Partridges being sent into our house from the patio, as an attention from one of the Gaucho peones. These had been taken by the method then in vogue, in which the horseman, armed with a long slender bamboo at the extremity of which there was a horsehair noose, rode in an ever-narrowing circle round the crouching bird until he was able to drop the noose over its neck. That ingenious—if non-sporting—art has long disappeared in the limbo of the past. Elsewhere, I have known of a piece of fencing-wire being used as a missile by the horseman, and a most large and unrighteous bag made thereby.

The passing of the giant grasses was bound to affect the status of the Common Partridge all over the pampa. But such episodes as a four-years' drought, which left the plains as bare as a billiard-table, was a supplementary catastrophe.

So was a three-years' flood, spoiling the nests and diminishing the area of the birds. Add the gunner's toll all the year round (for the close-season is practically a dead letter so far as local protection is concerned), and it will be found that the Fates have been cruelly against this well-known denizen of the Province of Buenos Ayres. To one peril, however, an adjunct of civilisation, it managed to adapt itself. I allude to the wire fence. At the outset, the Partridge failed to take into consideration the new obstacle, with fatal results; this was especially the case on the railways, where the sudden rattle and roar of the oncoming train had an utterly demoralising effect. But for a long time past this has ceased to be the case; and the disturbed bird, feeding inside the double line which guards the railway, goes up against the wind and passes just over the fence, instead of blundering blindly into it.

The nesting-period I now put back to the beginning of October, and its duration to early in April. I suspect that there must be two broods in the season, to judge from the late nests. Similarly, I have never again met with a clutch of nine eggs, or even eight; from four to seven has been the general number, the latter not unfrequent. Mr. Hudson is quite right in stating that "the wine-purple coloured eggs vary somewhat in hue, having a reddish tinge; others are of a deep liver-colour."

The eggs average 44×32 mm.

433. **Rhea americana** Lath. Common Rhea.

When I wrote of the Rhea in 1880, it was still truly a wild bird. As I then stated, it had been nearly extirpated in the district, at that time open and unfenced, and where the hunter of all *feræ naturæ* such as the Rhea and the Nutria (feather and fur) took toll at his own free will. My father's efforts to save the Rhea and our two Tinamous from extinction, were, as I then anticipated, difficult to carry into effect; and by 1884 it was a doubtful question if there still existed a pair of the former in the Rincones. However, I was then in position to improve the state of things myself. The

Rincones and the northern part of the estancia had been fenced-off against intruders; and when the baffled poachers of the little town of Ajó took to boats and went down the river and so into the Rincones, I succeeded in getting the Customs Authorities to prevent them. Our own people were equally bad (the temptation of "Bolearing" a "Ñandu" is irresistible to the Gaucho-man); and to them I gave the warning that the first individual found running the Rhea or the Camp Deer (*Cervus campestris*) would be incontinently discharged. The result was that, in a few years, we had come to have quite a fair number of Deer and an abundance of Rheas. Indeed, after a while, the pendulum had swung to the other extreme—not as regards the former, always a shy animal and never seen out of the Rincon fastnesses, but in connection with the bird. In the open camp it was an awkward enough customer in the nesting-season, owing to the tactics of the male birds towards any intruding horseman: but when we took to encouraging them in a semi-domesticated state about the woods and paddocks of the head-station, they became a nuisance. One's horse might be the most equable steed conceivable, but when suddenly subjected to the surprise-attack of an old cock in charge of his "charras" the result was either a frantic bolt through the scattered trees, or, if checked, a rearing and bucking incident. The stately slow-pacing bird was unrecognisable in this attack—as it swept forward, half-crouching, the neck incurved, the wings extended to their utmost limit and sweeping the ground, and the beak clattering like castanets—not in a direct line even, but in bending curves. On foot the peril was even greater, the object of the assailant being to come to close quarters and strike downwards with powerful leg and claws. In the end the shotgun had to be resorted to, and the number reduced to an odd pair or two in the least-frequented paddocks. I much doubt whether, at the present moment, any of my men are the happy possessors of a pair or two of "bolas de avestruz." The "boleada" is a most picturesque sport, but it is not compatible with the peaceful welfare of well-bred herds and stud-flocks. So now the Rhea is only tolerated on sufferance and preserved from extinction as an "interesting bird."

Hudson mentions how the Rhea used to conceal itself amidst the great grasses. But he does not add that it adopts the same trick when closely pursued and exhausted. It then doubles to one side and, as the horseman shoots beyond it, throws itself flat, with wings closely folded to the body and the neck outstretched flat along the ground. So closely does the plumage of the bird then harmonise with the surroundings that I have been unable on these occasions to detect it, even whilst my horse was almost moving over it; and it has been the large black unwinking eyes which have first caught my own and guided my glance along the neck to the crouched and immovable body. The whole attitude affords a correct explanation of the erroneous expression which alludes to the Ostrich "hiding its head in the sand and thinking itself concealed from the hunter." Did the Rhea always succeed in keeping its head out of view the hunter would have much difficulty in placing the bird.

ADDENDA.

342. **Sarcidiornis carunculata** Licht. Crested Duck.

Adult female. Iris dark blue; pupil black; feet slate-blue.

I have omitted to chronicle in its proper place the solitary occurrence of the Crested Duck; particularly interesting as its habitat is given by Sclater and Hudson as "Brazil, Paraguay, and northern confines of Argentina." And they add, "Dr. Burmeister met with this Duck in the province of Tucuman, and it probably occurs also in other places on the northern frontiers of the Republic."

The wandering individual in question was shot near Linconia, on 15 September, 1898. My collector informed me that it was in the company of other ducks and very difficult of approach.

38. **Tanagra bonariensis** Gm. Blue-and-Yellow Tanager.

Claude Grant's strong belief in the local nidification of this species has been justified. This season (1918–1919) has afforded me the opportunity of examining four nests, one of which contained a clutch of three eggs.

Two circumstances may have militated against any previous discovery: the position of the site chosen and the late period of incubation. It will probably be found that the summit of the practically inaccessibly dense and thorny Coronillo tree is a favourite situation, as I have found it to be with the equally conspicuous Guira Cuckoo (*Guira piririgua* Vieill.), and that the season is when the summer is at its full.

All four nests were at a height of from ten to thirty feet from the ground; those from Linconia garden being situated respectively in an Australian wattle, a quince, and an orange tree; the Ynglesés type in the top of a Coronillo tree. The structure is irregular and untidy, yet gives the impression of a vast amount of laboured design and execution, secure whilst *in situ*, but incohesive on removal. The outside measurements are about 6 × 4½ inches, and the cavity may be either shallow as in the Linconia nests, or cup-shaped as in mine. The materials vary according to circumstances, the principle adopted being that of twigs on the outside, then a very large quantity of the dry wire-like leaves of the Casuarina (failing which, horsehair) woven circularly with infinite and meticulous care; and finally, in the first cases, the lining completed with horsehair. On the whole, it is a nest *sui generis*; and, once seen, not likely to fail of subsequent recognition.

The nesting-season may be taken to range from 20 December to 16 February, to judge from this series. The nest with eggs was taken on 8 February.

Unfortunately the eggs in my nest were destroyed by the Cow-bird. Two of the Linconia nests contained only eggs of this parasite. But the third had the clutch alluded to; and I am indebted to the kindness of the lucky collector (and discoverer of all four nests), Mr. L. J. Runnacles, for an opportunity of furnishing the exact description. At the first glance they show a considerable resemblance to those of the European Sparrow (though larger), the ground-colour being of a bluish white, thickly speckled and spotted with light and dark brown. These markings increase, however, towards the blunt end, where they form a circle of stronger and darker blotches combined with a few streaks of the same colour.

260. **Colaptes agricola** Malh. Pampas Woodpecker.

To the neighbouring establishment of Linconia is also due the first and only record of the Pampas Woodpecker, a pair having appeared about the garden there early in the present year, 1919 ; one of which was shot on 1 February by Mr. L. J. Runnacles, who kindly gave me an opportunity of examining the skin.

Mr. Hudson writes in 1889 of the growing rarity of this species. He had known it well as a small boy, but had come to regard it as "nearly extinct, and one may spend years on the plains without meeting with a single example." But in this locality, the conditions of which have undergone none of the changes he alludes to, I have never known it at all since the time I took up residence in 1872. After reading Hudson's account of the species, as related in 'Argentine Ornithology,' I had kept a particular watch for the occurrence of any chance individual. And it is therefore curious that only now, and so late in the day, it should come to be included in my local list, either as visitor or resident.

263. **Ceryle americana** Gm. Little Kingfisher.

To show that this Kingfisher only requires a little encouragement in the nature of its environments in order to extend its range, I would mention that Mr. M. A. Runnacles recently informed me of how an individual of this species, in the great flood of 1913–15, took up its abode at Linconia, frequenting an artificial duck-pond in a secluded spot amidst the willow-trees of the garden. It resided there for about a year, but never paired, and hence had no occasion to avail itself of any suitable nesting-site in the banks of the deeply-excavated pond.

287. **Asio brachyotus** Forst. Short-eared Owl.

At last I have had the good fortune to be shown and take a clutch of eggs *in situ* of this Owl. The date, 8 March, 1919, is very late, the end of summer in fact; but the three eggs were much incubated.

The locality was a lonely part of the Camp, far from traffic, in a hollow or depression in the plain, filled by a dense growth of green weeds, knee-deep. Nest proper there was none, only a hollow in the bare earth. My companion and I had approached it very quietly, and the bird sat so close that we actually looked down upon it from our horses for a moment before it silently took to flight. A similar nest, a few hundred yards away, contained some broken egg-shells; and Docherty, my collector, told me the mischief had been done by Caranchos.

The said collector had also secured for me another clutch of four incubated eggs, taken on 15 November of last year (1918). I should judge these to belong to the same pair of birds, in all probability from the earlier nest. In this case the nest was in a tuft of grass.

The first-mentioned clutch averages 42 × 43 mm.; the second 42 × 34 mm., ranging from 41 to 44 mm. in length and 33 to 35 mm. in breadth. White, of course, in colour; and, as seen from the measurements, nearly spherical in shape.

300. **Geranoaëtus melanoleucus** Vieill. Chilian Eagle.

Mr. M. A. Runnacles confirms my impression that this fine bird had abandoned its old haunts in the Rincones some twenty years ago (*i. e.* 1900). He himself had never seen a single bird since he went into residence at Linconia at that date: and indeed was totally unacquainted with the species.

The odd thing is, that only a fortnight after I had jotted down the preceding note in my journal—or, on 15 February, 1919—one of my shepherds told me that he had just seen an Eagle near the Yngleses head-station woods being followed and mobbed by half-a-dozen Caranchos in the usual fashion. A stray individual presumably.

339. **Coscoroba candida** Vieill. Coscoroba Swan.

In looking over a collection of eggs made for me by D. Docherty, I find that in 1915 he took two fine clutches of eight incubated eggs on 18 August and 15 October respectively. Both these nests were in juncales and built of dry juncos. They are, therefore, further examples of the curious recurrences to swamp-nesting—*i. e.*, in deep waters (as is the custom of the Black-necked Swan), instead of on an island or at least marshy ground.

II.—*List of the Birds of the Canary Islands, with detailed reference to the Migratory Species and the Accidental Visitors.* Part V. ALCIDÆ—PHASIANIDÆ. By DAVID A. BANNERMAN, M.B.E., B.A., M.B.O.U., F.R.G.S.

Family ALCIDÆ.

Alca torda. Razorbill.

Alca torda Linn. Syst. Nat. 10th ed. 1758, p. 130—Type locality: Sweden.

The Razorbill is a **Rare Visitor.**

It has only been recorded on a few occasions and is first mentioned by Webb and Berthelot*, who say it is found on the shores of almost the entire Archipelago, but is more numerous in the eastern group (Orn. Canarienne, p. 41).

About fourteen years later Bolle* published his notes to the same effect (J. f. O. 1855, p. 177), and later wrote that it was several times killed by Berthelot in Canaria, where it appears in the harbour of Ciudad [the old town harbour of Las Palmas about three miles from the present landing place—the Puerto de la Luz], according to the opinion of competent naturalists, only as a bird of passage in winter (J. f. O. 1857, p. 348).

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* Godman in his paper (Ibis, 1872, p. 224) transferred Webb and Berthelot's and also Bolle's remarks on the Razorbill to the Little Auk, and gives their notes on the Razorbill under the latter species (*Alle alle*) in his own paper—an unfortunate error which later led Cabrera to think that Godman saw the Little Auk in the Canaries and to quote this in his list (Catálogo, p. 70). Even more unfortunate is the inclusion of the Little Auk as a visitor to the Canaries in the B. O. U. List of British Birds, 1915, p. 280. A glance at the references given by Godman will confirm this: he gives *Alca minor* [of Brisson], which is the Razorbill (and which name both Webb & Berthelot and Bolle employed in their writings), as a synonym of *Mergulus alle* (Linn.). The Little Auk has *never* occurred in the Canary Archipelago. This question will be fully dealt with in Appendix B under *Alle alle*.

Savile Reid mentions that he did not meet with the Razorbill himself, but records that Don Ramon Gomez had specimens in his collection from the neighbourhood of Orotava; he notes "This is the only member of the Alcidæ I recorded as Teneriffian" (Ibis, 1888, p. 82).

Meade-Waldo recorded it (Ibis, 1893, p. 207) as "a quite accidental visitor," and notes that he knew of but two examples from the islands.

It does not seem to have been observed since 1891.

Range. The Razorbill breeds in Europe, and in winter wanders to the Mediterranean seas. It has occurred once only in the Azores; the Canary Islands are probably the most southern point from which this species has been recorded on the African side of the Atlantic. The Razorbill also breeds in North America, extending to Long Island in winter.

Uria troille troille. Common Guillemot.

Colymbus troille Linn. Fauna Suecica, 2nd ed. 1761, p. 52 —Type locality: Spitsbergen.

The Common Guillemot is a very **Rare Visitor.** It has only once been properly identified, and then by Bolle who saw a specimen in the Léon collection in Canaria (J. f. O. 1857, p. 348). Prior to this Webb and Berthelot record the bird (Orn. Canarienne, p. 41) as a migrant, and very probably the bird in the Léon collection was the only one ever obtained. Webb and Berthelot might possibly have known this collection, for although they were working in the Canaries twenty-two years before Bolle arrived, we have no record of when the Léon collection was formed. The

Canary Islands are far beyond the normal limits frequented by this species.

Range. The Common Guillemot breeds in Europe as far south as the Berlenga Islands off Portugal. It also occurs on both coasts of north America. In winter the European birds wander south to about 30° N. in the Atlantic, occasionally entering the Mediterranean. The bird which occurred in the Canary Islands must have strayed miles farther south than any have done for a very long time.

Fratercula arctica arctica. Puffin.

Alca arctica Linn. Syst. Nat. 10th ed. 1758, p. 130—Type locality: Sweden.

The Puffin is a **Rare Visitor.** It has been recorded on three or four occasions.

Meade-Waldo saw a young Puffin which had been obtained at Orotava (Ibis, 1893, p. 207).

Hartert saw specimens in both Cabrera's and Ramon Gomez's collection in Tenerife in 1901 (Nov. Zool. 1901, p. 306, lower footnote); the former may have been the young bird which Meade-Waldo mentions (*supra*), as most of the "rarities" occurring in Tenerife found their way into Cabrera's possession.

Cabrera does not, however, include the species himself in his Catalogue, so the bird which Hartert saw may have been obtained between 1893 and 1901, after Cabrera's list was published.

Lastly, I examined a stuffed example of this species in the Gonzalez collection in Lanzarote which had been obtained near Arrecife (Ibis, 1914, p. 63).

Range. The Puffin breeds in the north Atlantic as far south as the Berlenga Islands off Portugal, and in winter visits the western Mediterranean and in the Atlantic ranges as far south as the Azores, very rarely reaching the Canaries.

Family Thalassidromidæ.*

Thalassidroma pelagica. Storm Petrel.

Procellaria pelagica Linn. Syst. Nat. 10th ed. 1758, p. 131 —Type locality: Coast of Sweden.

I have termed the Storm Petrel an **Annual Visitor**, for it does not fall into any of the other seven categories into which I have divided the avifauna of the Canaries.

The first record of *T. pelagica* from the islands is given by Ledru in 1810 in his List of the Birds of Tenerife, vol. i. p. 184.

Webb and Berthelot in 1841 wrote "It appears that this species is found from time to time on the coasts of the Canary Islands" (Orn. Canarienne, p. 45). They record a bird which was caught by the fishermen and kept alive several days.

Bolle was of opinion that this was the Storm Petrel most frequently met with in the Canary seas (J. f. O. 1857, p. 346).

Meade-Waldo found it always about the islands (Ibis, 1893, p. 206). Cabrera possessed a specimen which had been caught at Punta del Hidalgo in Tenerife, and remarked that it occurred fairly frequently but was rare in certain seasons (Catálogo, p. 65); while Polatzek considered it but a rare visitor (Orn. Jahrb. 1909, p. 133).

There is no actual record of the Storm Petrel breeding in the Canary group, although I strongly suspect that it will be found to do so. While living on the deserted islet known as Montaña Clara from June 7 to 14, 1913, we procured from a hole in a cave on June 9 a Storm Petrel with testes enormously developed (Ibis, 1914, pp. 78, 263). As I have already suggested in my paper on the Tubinares of the North Atlantic Islands (Ibis, 1914, p. 450), it seems reasonable to suppose that the bird may have intended to breed on the island.

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* By force of circumstances the records of the Petrels and Shearwaters which visit the Canary Islands and do not breed there are exceedingly sparse. The conclusion must not be drawn from this that these ocean-birds are correspondingly rare in the seas of the Archipelago. We know that they do occur there and sometimes in considerable numbers. These I have termed "Annual Visitors" which visit the Archipelago annually but at no fixed season of the year, and which have not been known to breed in any of the islands.

The Distribution and Nidification of the Tubinares in the North Atlantic Islands are fully discussed by me in 'The Ibis,' 1914, pp. 438-494.

From the above notes I gather that *T. pelagica* visits the Canary Islands annually but at no settled period of the year. It cannot therefore be said to be either a Summer or a Winter Visitor, nor is it a Partial Resident, for it does not appear to breed regularly, if at all, in the Archipelago. Nor can we class it an Occasional Visitor.

Range. The range of the Storm Petrel is: Eastern portions of the north Atlantic south to west Africa, also western Mediterranean. It has been known to breed as far south as the Desertas (Madeira group), and in winter ranges to the Cape. Its distribution in the north Atlantic islands is fully discussed in 'The Ibis,' 1914, pp. 448–450.

Oceanodroma leucorrhoa leucorrhoa. Leach's Fork-tailed Petrel.

Procellaria leucorhoa Vieillot, Nouv. Dict. d'Hist. Nat. nouv. ed. xxv. 1817, p. 422—Type locality: France (Picardy).

The Fork-tailed Petrel is an **Annual Visitor**, chiefly in winter, to the Canary seas.

It is recorded by Meade-Waldo as an occasional visitor in winter; he did not see it at any other time of the year (Ibis, 1893, p. 206). I have examined a specimen in the British Museum which he obtained in Tenerife on the 23rd of February (Ibis, 1914, p. 451). This must be the bird mentioned by him in 'The Ibis,' 1889, p. 517.

M. J. Nicoll saw many *O. leucorrhoa* just before sighting Gran Canaria on the 12th of November, 1905, when Naturalist on the late Lord Crawford's yacht 'Valhalla' (Ibis, 1906, p. 667).

Leach's Petrel has been erroneously recorded (Orn. Jahrb. 1913, p. 193) by von Thanner (from the reports of fishermen) as breeding on Montaña Clara, one of the eastern islets—a statement which I have proved to be quite without foundation (Ibis, 1914, pp. 269, 270).

Range. Leach's Fork-tailed Petrel inhabits the north Pacific Ocean and the extreme north Atlantic and breeds also on many of the islets off the British Isles. In winter it is a visitor to all the north Atlantic islands, and is thus dealt with in detail in my paper on the distribution of Petrels and Shearwaters in the north Atlantic (Ibis, 1914, pp. 450, 451). It has also occurred off Liberia, Sierra Leone, and the Gold Coast on several occasions, and is said to visit south Africa casually. Two other races have been described from the Pacific (*cf.* Oberholser, Proc. U.S. Nat. Mus. vol. liv. 1917, pp. 165–172).

Oceanodroma castro castro. Madeiran Fork-tailed Petrel.

Thalassidroma castro Harcourt, Sketch of Madeira, 1851, p. 123—Type locality: Desertas Islands, Madeira group.

The Madeiran Petrel is a **Rare Visitor** which has been recorded only once, M. J. Nicoll having observed large numbers on 12 November, 1905, just before reaching Gran Canaria during the cruise of the 'Valhalla' (*cf.* Godman, Monograph of the Petrels, p. 16, et Nicoll, Ibis, 1906, p. 667).

Polatzek also mentions this species in his list of breeding birds (Orn. Jahrb. 1909. p. 24), but solely on hearsay and on no real evidence whatsoever.

It is extraordinary that it has not been observed more often, for it is a remarkable fact that it breeds in every other group of the north Atlantic islands from the Azores to the Cape Verde Archipelago (*vide* Ibis, 1914, pp. 451–460). I do not believe it breeds anywhere in the Canary Archipelago (Ibis, 1914, pp. 85, 269). Neither Webb and Berthelot, Bolle, Godman, Savile Reid, Meade-Waldo, von Thanner, nor myself have ever seen it.

On the above evidence I cannot possibly include this species with the other Petrels which I have termed Annual Visitors.

Range. The Madeiran Petrel breeds in the Azores, Madeira group, Salvage Is., Cape Verde Is., and in St. Helena.

Birds breeding in the Pacific on the Hawaiian and Galapagos islands have been separated as subspecies. The nidification and distribution of this species in all the north Atlantic archipelagos is fully dealt with by me in 'The Ibis,' 1914, pp. 451–460.

Oceanites oceanicus oceanicus. Wilson's Petrel.

Procellaria oceanica Kuhl, Beiträge Zool. i. 1820, p. 136 —Type locality: South Atlantic.

Wilson's Petrel is probably an **Annual Visitor** to the Canarian seas, usually appearing in late spring, but has been noted at all seasons.

It is mentioned by several writers, but very few appear to have seen the bird personally. Meade-Waldo observed it occasionally at all seasons of the year (Ibis, 1893, p. 206), particularly on 15 May, 1888, off Garachico, Tenerife (MS. note-books). There is also a bird which I have recently examined in the Liverpool Museum labelled "♂. Orotava, Tenerife. R. Gomez (Coll.), 16. vi. 87."; and in the British Museum a specimen obtained by Lort Phillips in May "south of the Canaries."

It is worthy of notice that the only records occurred in May and June, and that Godman obtained specimens near Fayal, Azores, on 21 May, 1865 (Ibis, 1866, p. 104). It must be remembered how few observers know the bird well enough to recognise it at any distance, and the paucity of actual records can be placed to this account.

Range. Wilson's Petrel breeds in the South Polar regions, migrating northwards in winter. It has a very wide distribution in all seas excepting the north Pacific. I have dealt with its occurrences in all the north Atlantic islands in 'The Ibis,' 1914, pp. 460–461.

Pelagodroma marina hypoleuca. North Atlantic Frigate-Petrel.

Thalassidroma hypoleuca Moquin-Tandon, in Webb, Berthelot et Moquin-Tandon, Orn. Canarienne, 1841, p. 45 —Type locality: Tenerife.

This Frigate-Petrel is probably a rather scarce **Annual**

Visitor to the Canary-island seas, and although the type specimen was described from the coasts of Tenerife it has never been known to breed in the Archipelago, and therefore cannot be said to really inhabit this group. The records of this Petrel being taken in the Canary Islands are not numerous. I enumerated them all in my paper on the Petrels already alluded to (Ibis, 1914, pp. 463–464).

Serra ('Ornithologia Canaria') and Drouet, in his 'Faune Açoréenne' (1861), are both said to mention the Frigate-Petrel from the Canaries.

Savile Reid records an example which was brought to him alive in Tenerife on the 20th of March, 1887, and which is now in the British Museum (Ibis, 1888, p. 81).

The only other specimen in the National Collection was obtained by Meade-Waldo on the 20th of May, 1889, in Tenerife; this is probably the specimen mentioned in 'The Ibis,' 1889, p. 517. Meade-Waldo found it "not common," and noted that several were caught by the fishermen every spring (Ibis, 1893, p. 207).

Cabrera had an example in his collection which was procured at Tegina on the coast of Tenerife; he remarks that it is sedentary and locally distributed on certain coasts of the islands (Catálogo, p. 65); but Bolle never met with it (J. f. O. 1857, p. 346), although he is erroneously quoted as having done so. On the other hand, Bolle himself quotes Berthelot as saying that he had observed *T. hypoleuca* constantly all round the waters of the Canary Islands (J. f. O. 1857, p. 346).

Range. The North Atlantic Frigate-Petrel breeds in the Salvage Is. and the Cape Verde Is., and is accidental in the Azores and Madeira group. I have dealt with its distribution and nidification in these islands in 'The Ibis,' 1914, pp. 461–465. The typical species (*P. marina marina*) was described from 37° S. by Latham.

Family PUFFINIDÆ.

Puffinus puffinus puffinus. Manx Shearwater.

Procellaria puffinus Brünnich, Orn. Bor. 1764, p. 29 —Type locality: Faeroe Islands.

The Manx Shearwater is an **Annual Visitor** to the seas surrounding the Canary Islands.

It is first recorded from the Archipelago by Ledru in 1810 (Voyage aux îles de Ténériffe, vol. i. p. 185) in his List of the Birds of Tenerife. It is next mentioned by Webb, Berthelot, and Moquin-Tandon in their 'Ornithologie Canarienne,' p. 43, where they say that it is to be found, "Dans l'île déserte d'Alegranza où elle habite toute l'année."

Bolle (J. f. O. 1855, p. 178) also includes the species (on the authority of Berthelot) as an inhabitant of Allegranza, but in his next paper (J. f. O. 1857), after he had apparently paid a visit to the island himself, he omits it altogether from his final list, which points to his not having found Webb and Berthelot's statement to be correct.

The next record is given by Savile Reid, who during a visit to the islands in 1887 saw hundreds of *P. p. puffinus* on the sea off Tenerife on the 19th of March (Ibis, 1888, p. 80).

The following year Meade-Waldo records many Manx Shearwaters at sea off Garachico, between Tenerife and Gomera, on the 15th of May, 1888 (MS. note-books), and in his "List of Birds observed in the Canary Islands" wrote that he considered it "sometimes common on the water in winter," and further remarked that "it does not seem to come to land" (Ibis, 1893, p. 206).

Cabrera included it in his list as common in the islands of the western group, nesting ("anidando") on the deserted rocks, and cited Berthelot and Godman as his authorities (Catálogo, p. 65).

Ramon Gomez, the Orotava chemist and bird-collector, obtained a specimen in June. I made a note of this but have mislaid the original reference. Probably it was in MS.

Koenig recorded a specimen from Palma (J. f. O. 1890, pp. 462 et 487) which was *presented* to him, and this bird, so Dr. Le Roi told me in a letter in 1914, is no longer in the Koenig Museum but has long since been destroyed. There is another skin in the Bonn Museum which is labelled from Tenerife but with no further data.

As recently as 1905 it has been said by Floericke that *P. p. puffinus* breeds in the eastern islands (A. d. Heimat d. Kanarienvög. 1905, p. 95). This statement I have proved to be quite untrue, and I doubt very much whether the Manx Shearwater has ever bred on any of these islands (Ibis, 1914, p. 476).

Polatzek has without comment quoted Floericke's remarks (Orn. Jahrb. 1909, p. 23); he does not mention ever having seen the Manx Shearwater himself.

I did not meet with any sign of *P. p. puffinus* in Allegranza, Montaña Clara, Graciosa, the Roque del Oueste, or in either of the larger eastern islands during my expedition after Petrels and Shearwaters in May and June, 1913 (Ibis, 1914, pp. 85, 269), and so can only consider it an Occasional Visitor which sometimes, as in 1887 and 1888, visits the seas of the Archipelago in large numbers.

Range. The Manx Shearwater breeds in the islands off the coast of Great Britain. Its main breeding station in the north Atlantic islands is the Madeira group. It is said to breed sparingly in the Azores and Salvage Islands.

I have dealt with the distribution and nidification of this species fully in 'The Ibis,' 1914, pp. 472–477.

* **Puffinus kuhli fortunatus.** Canarian Kuhl's Shearwater.
(= *Puffinus kuhli flavirostris* auctorum.)

Puffinus kuhli fortunatus Bannerman, Bull. B. O. C. xxxv.

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* In this list of Canarian birds I am following strictly the nomenclature used by the compilers of the B. O. U. List of British Birds (1915), except in one or two cases particularly noted on page 96 of Part I. I am now, however, inclined to agree with Mr. Mathews that Kuhl's Shearwater can no longer be placed under the genus *Puffinus*, and in future shall accept the new genus *Calonectris*, in which Mr. Mathews and Mr. Iredale propose to include this species.

1915, p. 120—Type locality: Isla Graciosa, Eastern Canary Islands.

This race of Kuhl's Shearwater is a **Summer Visitor** to the Canary Islands, absent only three months in the year.

Hab. in Archipelago.

The seas of all the islands, breeding on the following islands and rocks:—

Western Group: Gran Canaria, Tenerife, and probably Palma, Gomera, Hierro.

Eastern Group: Fuerteventura, Lanzarote.

Outer islets: Lobos, Graciosa, Montaña Clara, Alleganza, Roque del Este, Roque del Oueste.

Obs. In the Bulletin of the British Ornithologists' Club, vol. xxxv. 1915, pp. 118–120, I showed that the Shearwater inhabiting the north Atlantic islands could no longer retain the name *P. k. flavirostris* Gould, which form is confined to the Cape seas, and is a totally distinct bird from the form inhabiting the Canaries and islands to the north of this Archipelago. I therefore proposed the new name *Puffinus kuhli fortunatus* for the latter bird and recognised five distinct geographical races of this Shearwater.

Dr. Hartert then wrote to me that he believed the Shearwater which bred in the north Atlantic archipelagos (Azores, Madeira, Salvages, and Canary Islands) was identical with *P. k. borealis* of Cory; and if this proves to be the case then Cory's name has undoubted precedence over mine, and the Canarian bird must then be known as *P. k. borealis,* which Hartert has already accepted. Until they are conclusively proved to be identical—and this to my mind cannot be done until a large series from both sides of the Atlantic are compared—I prefer to treat the birds from the other side of the Atlantic as distinct under Cory's name. At present we have only a very few American specimens, though an enormous series from the African islands is in the British and Tring Museums.

P. k. borealis is not yet known to breed off the American continent, but if, as Dr. Hartert thinks, it wanders across the Atlantic from the African islands, it is curious that it should turn up there at a time when *P. k. fortunatus* is breeding. I am strongly inclined to agree with Messrs. Mathews and Iredale that Petrels and Shearwaters do not wander hundreds of miles from their breeding quarters, and I maintain that the African islands Shearwater must bear the name I bestowed upon it, until it is proved to be undoubtedly the same as the American bird. When this has been done to my satisfaction I shall be the first to sink my name and make it a synonym of *P. k. borealis.* As yet I am not convinced that I am in error.

Mr. Francis Harper, of the American Biological Survey, has most kindly got together all the available data referring to *P. k. borealis* in American waters. He writes me under date 17 August, 1919, as follows :—"I have just managed to collect for you some data on the North American occurrences of *Puffinus borealis.* It is known on this side only from Long Island, Rhode Island, Massachusetts, and somewhat doubtfully from Labrador.

"The Long Island dates range from August 6 to October 18; the Rhode Island dates from July 21 to November 16: and the Massachusetts dates from August 2 to October 16 and perhaps November.

"On August 8, 1915, Murphy and I collected seven specimens, together with an equal number of *P. gravis*, off Montauk Point, Long Island, and saw a number of others. There were four males (length in flesh 19·87–22·50 in.) and three females (21·25–22·25 in.). The testes of the males were small, and either white or half-pigmented; the ovaries of two females were noted as 'small': of the third, '½ in. long.'

"Colors of soft parts as follows: 'Bill straw-yellow, an obscure dusky band across the bases of the nails. Tip and edge of upper nail also dusky. Iris dark olive-brown. Outer side of tarsus, outer toe, under side of all toes, dusky, with a pinkish tinge, irregular area toward tip of webs dusky. Rest of webs, inside of tarsus, upper side of two inner toes, flesh color, with pinkish tinge. Nails horn color, with a dusky streak on each side extending to tip.'"

In the British Museum we have only five skins, four collected in September 1886 at Wood's Holl, Mass., and one in October of that year "off Gay Head."

P. k. fortunatus breeds in hundreds in the Canary Archipelago—I believe on the coasts of all the islands, and although I have not actually traced any records from Gomera and Hierro, there can be little doubt of its nesting there. Its principal breeding-stations in the Archipelago are all the outer islets (Ibis, 1914, pp. 267, 268). I have studied the habits of this species carefully and already published my field-notes (Ibis, 1914, pp. 66–70, 80 et 267) at some length.

The main body of Canarian Kuhl's Shearwaters arrive in the Archipelago at the beginning of March, Savile Reid noted many hundreds off Tenerife on the 19th of March, 1887 (Ibis, 1888, p. 80). They do not seem to commence nesting in this month or during the early part of April, for Meade-Waldo, who visited Graciosa on the 6th of April, 1890, reported that the Shearwaters had not yet arrived in their breeding-holes (Ibis, 1890, p. 437 and MS. diaries). The fishermen on Graciosa told me that the birds arrived in their nesting-holes during the latter part of April and beginning of May "to clean their nests" (Ibis, 1914, p. 68).

Meade-Waldo saw them "in swarms" off Garachico (Tenerife) on the 15th of May, 1888 (MS. diaries).

When I visited Graciosa from May 27–31, 1913, the Shearwaters were all paired in their nesting-holes, but no eggs had been laid. The birds commenced to lay the first week in June, and by the second week in June nesting seemed to be in full swing on all the outer islets (Ibis, 1914, pp. 66–70, 80 et 87). The young are hatched in July.

At the latter end of October the Shearwaters begin to leave their nesting-places, and the main body finally leave the islands in November (Ibis, 1914, p. 470). Bolle thought that they left the islands in September (J. f. O. 1857, p. 344), but many turn up in the neighbourhood of Gran Canaria between the 1st of October and 17th of November (Ibis, 1912, p. 574). Meade-Waldo obtained three, and remarks that they were fairly plentiful off Orotava between October 23 and 25, 1887 (MS. diaries). After November the birds certainly go out to sea and are seldom noted, though a few may be seen in the Canarian seas during December and January.

The Shearwaters are absent from the beginning of December until the end of February.

Most authors include this Shearwater in their papers, but apart from the references given above no definite dates are mentioned by them.

Range beyond the Archipelago.

The Canarian Kuhl's Shearwater also breeds in the Azores, Madeira group, and Salvage Islands. Four more allied races are found in (1) Mediterranean, Adriatic, Ægean, and Sea of Marmora; (2) Cape Verde Archipelago; (3) Cape Seas; (4) the bird which appears off the N. American coasts and may breed on that side of the Atlantic. The distribution and breeding range of the north Atlantic forms are dealt with fully by me in 'The Ibis,' 1914, pp. 466–472.

Puffinus assimilis baroli. Madeiran Allied Shearwater.

Puffinus baroli Bonaparte, Consp. Gen. Av. 1856, p. 204 —Type locality: Desertas (Madeira group).

A Summer Visitor to the Canary Islands.

Hab. in Archipelago.

Western Group: Gran Canaria, Tenerife.

Outer islets: Graciosa, Montaña Clara.

Obs. P. a. baroli breeds on all the islands noted above. Although we have no records of this Shearwater breeding in Fuerteventura and Lanzarote or in the three extreme westerly islands, we must remember that the coasts of these islands are very little known. The possibility of its breeding on any of these islands must not be overlooked.

The Madeiran Allied Shearwater has been the cause of a great deal of discussion amongst ornithologists, especially with regard to the correct name it should bear. A review of the literature on this important question will be found in my paper on my expedition to the eastern Canary Islands (Ibis, 1914, pp. 264–266).

P. a. baroli appears to arrive in the Canary group at the end of January or early in February. At the end of February it seems to commence breeding in Tenerife—a very early date; but the breeding-time seems to vary in the different nesting-colonies : at any rate, I have taken eggs as late as 8 June on the outer islets. February, March, and April I believe to be the true breeding-season, prolonged in certain colonies until the end of the first week in June. By the end of that month I believe the birds have all reared their young in the Canary Archipelago, and they probably leave the islands soon afterwards. We have no records of the birds being seen in this group from the beginning of July until the end of January, although we have no data to show when they actually take their departure.

The following notes are arranged under the heading of the different islands in which they breed. I have already noted that considerable diversity seems to be shown in the breeding-time of the various colonies.

Gran Canaria.

Only one record from this island. Meade-Waldo found a pair breeding near Arucas; unfortunately this record was erroneously published by me under *Bulweria bulweri* (Ibis, 1912, p. 574).

Tenerife.

First mentioned by Webb and Berthelot from this island —they mention a bird taken by the Orotava fishermen in February 1829, and include the species only as "De passage accidentel," remarking that "La propagation de ce Puffin est encore inconnue," which proves that the authors had never found it breeding in the Archipelago (Orn. Canarienne, pp. 43, 44).

Savile Reid mentions a bird from Orotava picked up on the shore on the 15th of March, 1887 (Ibis, 1888, p. 81).

Meade-Waldo wrote it was "Resident, but not in great numbers; it breeds very early in the year" (Ibis, 1893, p. 207), noting that it lays at the end of February and beginning of March (Ibis, 1890, p. 437). Meade-Waldo has the following entry in his MS. diary under date 16 March, 1888: "Got a *Puffinus obscurus* * that a boy had brought in to Gomez and had caught in a cave this morning, he said it had a young one, it had the hatching spot on its breast."

Meade-Waldo says that he took on the 3rd of April an adult bird * sitting on an egg and young birds-in-down * on the 26th of April at Orotava; and again on 29 April, 1888, an entry in his MS. diary, "A boy brought a *P. obscurus* alive which he had caught in a cave."

Ramon Gomez—the Orotava chemist—obtained a male on the 16th of April, 1891, at Orotava, and a female on the 24th of April, 1888, at the same place. These two skins are in the Tristram collection in the Liverpool Museum, where I have examined them.

In May 1888, Meade-Waldo mentions seeing this Petrel on the water between Garachico and San Juan de la Rambla in company with four other species (MS. diaries).

It is curious that I have been unable to find any mention of this Shearwater in Tenerife later than the month of May. Its habits have not been studied very minutely in this island.

Outer islets.

Graciosa.—There seems little doubt that this Shearwater breeds on this island. Meade-Waldo visited Graciosa on the 6th of April, 1890, but did not meet with it (Ibis, 1890, p. 437). When camping on this island from 27 May to 7 June, 1913, I was assured by the fishermen (who showed me their nesting-holes) that *P. a. baroli* had already bred and departed. They told me that they came here in March (Ibis, 1914, p. 66).

Montaña Clara.—I spent a week on this island from June 7 to 14, 1913. Two eggs and young * in all stages were obtained. Two fresh eggs were taken on 8th of June (Ibis, 1914, p. 79).

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* Skins in the British Museum.

Range beyond the Archipelago.

The Madeiran Allied Shearwater breeds also in the Madeira group, Salvage Islands, and almost certainly in the Azores. It is represented by allied forms in several widely separated localities in the Pacific and Indian Oceans.

Its breeding range is dealt with fully by me in 'The Ibis,' 1914, pp. 477–483.

Bulweria bulweri bulweri. Bulwer's Petrel.

Procellaria bulwerii Jardine and Selby, Illustr. Orn. ii. 1828, pl. 65—Type locality: Madeira group.

A **Summer Visitor** to the Archipelago.

Hab. in Archipelago.

*Western Group**: Tenerife.

Outer islets: Montaña Clara.

Obs. Also recorded as breeding in Allegranza. It has ceased to breed there now apparently.

Bulwer's Petrel breeds in both the above-mentioned islands, but has not been recorded from anywhere else in the Archipelago except Allegranza. Webb and Berthelot (Orn. Canarienne, p. 44) give this latter island as its habitat in the Archipelago, and say of it: "Ce petit Puffin est très-commun dans l'îlot d'Alegranza; il niche dans les trous des rochers . . . Nous avons gardé plusieurs jours cinq ou six de ses 'Perritos' vivants, pendant notre sejour à Lancerotte. On nous les avait apportés d'Alegranza; . . ." From this account it seems certain that Bulwer's Petrel bred in Allegranza, but during my own expedition to these "outer islets" in 1913 no trace of Bulwer's Petrel could be found on that island (for an account of which see Ibis, 1914, pp. 84–87). It was, however, found on Montaña Clara.

Bolle confirms Webb and Berthelot's account, and wrote

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* The note which I published in my "Birds of Gran Canaria" (Ibis, 1912, p. 574) in error under the heading of this species, really referred to *Puffinus assimilis baroli.* Bulwer's Petrel has not yet been found breeding in Gran Canaria.

(J. f. O. 1885, p. 178): "This bird is also caught and killed in large numbers for food, especially in Allegranza where it is very numerous . . ."

In his last paper (J. f. O. 1857, pp. 345, 346) Bolle mentions a conversation with Berthelot, who referred to Bulwer's Petrel nesting on Allegranza.

Nothing very definite was known about this Petrel in the eastern group or outer islets until I visited them in May and June, 1913, for the express purpose of ascertaining which Petrels and Shearwaters bred there. The only island upon which Bulwer's Petrel was found nesting was Montaña Clara, where they were quite common. At the time of my visit on the 7th of June all the birds had laid, but the eggs were all perfectly fresh, and when we left the island on the 14th of June in no instance had the young hatched out (Ibis, 1914, p. 80).

In the western islands of the Archipelago Bulwer's Petrel is recorded only from Tenerife. Meade-Waldo certainly wrote (Ibis, 1893, p. 207): "Fairly common, it breeds on all the islands, usually under big loose stones at the foot of the cliffs," but from a perusal of his MS. note-books, which he most kindly lent me, he does not mention the bird anywhere but from Tenerife, though he is probably correct in saying it breeds at any rate in some other of the western islands. From Tenerife it is first mentioned by Meade-Waldo on the 6th of February, 1888,* when he noted "two or three off the coast of Tenerife" when on his way to Gomera (Ibis, 1889, p. 5). He remarks in a later paper: "Bulwer's Petrel (*Bulweria columbina*) breeds commonly along the cliffs; there are two places, not very far from each other, to the east of Orotava" (Ibis, 1889, p. 517). Savile Reid did not see any amongst the various species of Petrels and Shearwaters noted by him on the 19th of March, 1887, off Tenerife (Ibis, 1888, p. 80). This is not surprising, as I believe *B. bulweri* to be almost entirely a night-flying bird.

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* I regret that I missed this record when dealing with this species in my paper on the Tubinares (Ibis, 1914, pp. 488 and 493), the earliest record from any of the north Atlantic islands.

The next record from Tenerife is again given by Meade-Waldo, for he saw many off Garachico on the 15th of May, 1888 (MS. diaries).

In June records are plentiful from Tenerife.

Ramon Gomez obtained an egg on 12 June, and Meade-Waldo took a bird,* caught on its egg on 14 June. Adult birds* were also obtained by Gomez on the 18th. In the Cowley Bequest of eggs in the British Museum are specimens taken on the Anaga rocks off Tenerife on the 20th of June, while on the same date and following day Gomez took three adults* and one young† in down.

On the 25th of June three more adults* were obtained by Meade-Waldo at Santa Ursula (MS. diaries).

Koenig includes the bird and mentions a specimen from Tenerife which Gomez caught near Vilaflor on the 19th of July, 1888 (J. f. O. 1890, p. 463).

Cabrera had specimens in his collection and believed it was peculiar to the Canary Islands (Catálogo, p. 65).

The last mention of Bulwer's Petrel is by Polatzek, who remarks that it breeds in the Archipelago, leaving its nesting-places in the autumn and returning in the spring (Orn. Jahrb. 1909, pp. 23–24).

From the above records it appears that *B. b. bulweri* arrives in the Canary Archipelago in February, but does not commence breeding before May at the earliest. June is the month when nesting is in full swing, eggs taken by myself in the first and second weeks in June being the first obtained in the eastern Canaries. June 20 is the earliest date upon which young in down have been taken. The birds probably remain in the islands until the end of September, when they take their departure.

Range beyond the Archipelago.

Bulwer's Petrel breeds also in the Madeira group, Salvage Islands, and possibly the Azores, in the north Atlantic islands. A subspecies inhabits the Sandwich Islands in the Pacific and another closely allied subspecies the Bonin

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* The skin is in the British Museum.

† In the Tring Museum.

Islands, while from the Fiji group a distinct species of *Bulweria* occurs, a very curious fact already pointed out by Messrs. Iredale and Mathews (Ibis, 1915, pp. 607–608). I have dealt with the various breeding-places of this Petrel in the north Atlantic islands in 'The Ibis,' 1914, pp. 488–494.

Family PODICIPIDÆ.

Podiceps nigricollis nigricollis. Black-necked Grebe.

Podiceps nigricollis G. L. Brehm, Vög. Deutschl. 1831, p. 963—Type locality: E. Germany.

The Black-necked Grebe is a **Rare Visitor.**

It has been met with on one occasion only. During my expedition to the Eastern Canaries, my taxidermist, Mr. A. H. Bishop, identified a small flock of these Grebes which had flown onto the salt lake known as the Lago Januvio in Lanzarote (Ibis, 1914, pp. 57, 270). The birds arrived on the 21st of May, 1913, but only remained a short time before flying over the dividing spit of land out to sea. The weather was boisterous and the Grebes had evidently come in to shelter from the stormy seas on the calm water of the "Lago." We watched them through powerful glasses for some time.

Range. The Black-necked Grebe breeds in central and southern Europe and ranges east through central Asia to Japan. It has been recorded from the Azores, and is found throughout the greater part of Africa.

Podiceps fluviatilis. Little Grebe.

[? **Podiceps fluviatilis fluviatilis.**

Colymbus fluviatilis Tunstall, Orn. Brit. 1771, p. 3—Type locality: Great Britain.]

A **Rare Visitor.**

A Little Grebe has been recorded on one occasion only from the Archipelago.

Polatzek wrote (Orn. Jahrb. vol. xx. heft 5, 6, 1909, p. 1): "Inadvertently I did not include the Little Grebe (*Colymbus fluviatilis* Tunst.) with the birds of passage. In 1904 I found fourteen of these birds in the small salt sea—Lago Januvio—in Lanzarote, and I was told that they stayed there nearly all the year but had never been found to breed there. This diving-bird ('Taucher') is a new record for the Canary Islands."

I have purposely named this species binomially. Polatzek certainly records the typical species as the one which occurred, and was probably right in doing so; but it is possible that it might have been *P. f. capensis* which he noted and which he would not be able to distinguish at a distance from *P. f. fluviatilis*. As he does not appear to have obtained a specimen the identity of the race must remain in doubt. I have treated it accordingly.

Range. The typical European Little Grebe (*P. f. fluviatilis* Tunst.—Type locality: Great Britain) breeds in central and southern Europe and across central Asia to Japan. Also in north Africa.

The African Little Grebe (*P. f. capensis* Salvad.—Type locality: South Africa) ranges throughout Africa except the extreme north, also in south-western Asia and India.

Family RALLIDÆ.

Porzana porzana porzana. Spotted Crake.

Rallus porzana Linn. Syst. Nat. 12th ed. 1766, p. 262—Type locality: France.

The Spotted Crake is a **Rare Visitor** to the Canary Islands. It has however been recorded on several occasions, and it is reasonable to suppose that several have missed detection.

It is recorded first by Webb and Berthelot as "very rare," and they note that the only specimen in their possession was killed in March 1829 (Orn. Canarienne, p. 40).

Cabrera shot two in the spring near Laguna, but does not give the year (Catálogo, p. 60).

Meade-Waldo in his "List" says it is "a not unfrequent winter visitor" (Ibis, 1893, p. 201) and mentions Cabrera's birds (Ibis, 1890, p. 430).

I recorded one which was given to me in Lanzarote by

Don Gonzalez y Gonzalez, who had obtained it near Arrecife. This specimen is now in the British Museum (Ibis, 1914, p. 63).

There are few districts in the Canary Islands suited to this Crake, but the most favourable locality is certainly the ditches of the Laguna plains, while the "Charco" of Maspalomas in Gran Canaria and the Rio de las Palmas in Fuerteventura may also be occasionally visited.

Range. The Spotted Crake breeds in Europe southwards to the Mediterranean, and apparently in north Africa from Morocco to Tunisia. It is said to winter in India and Africa, but I am uncertain how far south it extends in the latter continent.

Porzana pusilla intermedia. Baillon's Crake.

Rallus intermedius Hermann, Obs. Zool. i. 1804, p. 198—Type locality: Strasbourg.

This Crake is an **Occasional Visitor** in winter to the island of Tenerife, where it has been obtained on a number of occasions on the Laguna plains.

It would appear to have been a fairly regular visitor to Tenerife about the years 1887–1891, for Meade-Waldo says of it that "it occurs during most winters at Laguna" (Ibis, 1893, p. 201).

Cabrera had one in his collection from Laguna (Catálogo, p. 60), but it appears to have been overlooked of recent years.

Von Thanner has only once recorded Baillon's Crake in his list of migrants, but it must be remembered that this observer has his headquarters at Vilaflor, which is many miles from Laguna and a district ill-suited to Rails. Von Thanner remarks (Orn. Jahrb. 1912, p. 227) that a female example of "*Rallus pygmæus*" was brought to him on the 4th of September, 1911, from Los Christianos in the island of Tenerife. This can only refer to Baillon's Crake—as *Gallinula* (not *Rallus*) *pygmæa* Brehm = *Rallus intermedius* Hermann = *Porzana pusilla intermedia* (Herm.).

Range. Baillon's Crake has an extensive breeding range in Europe and Asia, and is partially resident in Africa. The northern birds migrate in winter to Africa.

Porzana parva. Little Crake.

Rallus parvus Scopoli, Ann. i. Hist. Nat. 1769, p. 108—Type locality: Carniola.

The Little Crake can only be considered a **Rare Visitor** to the Archipelago.

Cabrera obtained two in the spring at Laguna (Catálogo, p. 60), which are doubtless the same pair which Meade-Waldo records having seen at Laguna (Ibis, 1889, p. 4, and 1893, p. 201).

Meade-Waldo's statement (Ibis, 1890, p. 430) that "it appears to be a pretty regular winter visitor to the ditches round Laguna" can hardly entitle it to a place amongst the regular "Winter Visitors," though it probably often escapes detection.

Hartert (from literature) notes (Nov. Zool. 1901, p. 306) that "the Little Crake is more or less regular in winter," which quite possibly is more correct than to term it a Rare Visitor. As, however, I can only trace three specimens I have scheduled it with the latter.

The last record is one of my own, for in 1913 I identified a Little Crake in the collection of Don Gonzalez y Gonzalez in Arrecife, Lanzarote, which had been shot in that island and the skin preserved (Ibis, 1914, p. 63).

Range. The Little Crake breeds in Europe, parts of Asia and north Africa. In winter it migrates south as far as equatorial Africa and north-west India, passing through the Mediterranean basin on migration.

Crex crex. Corn Crake.

Rallus crex Linn. Syst. Nat. 10th ed. 1758, p. 153—Type locality: Sweden.

The records available can only point to the Land Rail being an **Occasional Visitor** at the present day during the spring and autumn migrations.

There are very few records to help decide this question, but this is more likely to be due to lack of observers than to the non-arrival of the bird itself.

Meade-Waldo considered it to be "a regular migrant to Tenerife, but decidedly rare" (Ibis, 1889, p. 515), noting that a few appeared in the autumn and spring, being most frequent at Laguna (Ibis, 1893, p. 202).

Cabrera caught four in Tenerife, believing it to be an "accidental migrant" (Catálogo, p. 60).

Polatzek termed the bird an "occasional passer" (Orn. Jahrb. 1909, p. 129).

I identified a bird as belonging to this species in 1913 in the collection of Don Gonzalez in Arrecife, Lanzarote, said to have been shot locally (Ibis, 1914, p. 63).

Range. The Corn Crake breeds in Europe and western Asia and in winter visits Africa ranging to the Cape. It is said to breed also in the Azores, where it is reported to be fairly common.

Gallinula chloropus. Waterhen.

An **Occasional Visitor.**

Entire lack of any specimens for comparison prevents my determining whether the Moorhen of the Canary Islands is the large typical European form (*G. chloropus chloropus*), or whether it is the smaller African subspecies (*G. chloropus brachyptera*). I am inclined to believe the former is the race which occurs in the Archipelago, but until a bird is obtained for examination it must remain an open question. I have therefore employed binomial nomenclature for this bird.

The status of the Waterhen in the islands is not by any means easy to decide. I include it in this List as an Occasional Visitor, sometimes numerous in winter, which undoubtedly has been known to breed, at any rate in Gran Canaria. It may eventually have to be classed as a very rare Partial Resident, but unlike other Partial Residents its numbers are not augmented at regular seasons by fresh arrivals from Africa. It is also unknown whether the birds which breed in Gran Canaria are resident throughout the year, or whether they take their departure when the young are sufficiently strong.

Further investigation on these points is badly wanted. I append the somewhat conflicting statements of several authorities.

The Moorhen is first mentioned by Viera in his Diccionario (1799) according to Savile Reid (Ibis, 1888, p. 76) under the name "polla de agua," where it is stated to occur occasionally in Gran Canaria.

Webb and Berthelot (Orn. Canarienne, p. 40) wrote: "a not very rare migrant in the winter."

Bolle notes: "Frequently in winter during migration" (J. f. O. 1855, p. 177), and later: "I saw the Waterhen in several pairs breeding in the small reedy fishponds of Arguineguin" (Gran Canaria). "Then it was known only as a winter visitor" (J. f. O. 1857, p. 340).

Meade-Waldo notes: "An occasional straggler" (Ibis, 1893, p. 202). Some Waterhens arrived with the great migration on April 25, 1890, in Tenerife (Ibis, 1890, p. 429).

Cabrera shot several near Laguna and says: "An occasional migrant, fairly numerous" (Catálogo, p. 61).

Polatzek wrote: "An occasional migrant, sometimes rather numerous, I obtained a live one in Grand Canary and I found them also in Fuerteventura" (Orn. Jahrb. 1909, p. 129).

Von Thanner saw one in Fuerteventura on the 23rd of March, 1904 (Orn. Jahrb. 1905, p. 65) and thought it bred in the district known as Rio Palma and in the barranco de la Torre (Orn. Jahrb. 1910, p. 100). In February 1909 he found it in the Maspalomas Charco (Gran Canaria), and received a clutch of five eggs (apparently taken at this place) in the summer (Orn. Jahrb. 1910, p. 100).

My own experiences of the Waterhen have been confined to spending about ten days in the Maspalomas Charco (in February, 1912) without so much as catching a glimpse of the bird, which may for all that have been present, so thick was the vegetation (Ibis, 1912, pp. 565, 573).

Range. The range of the typical Waterhen (*G. c. chloropus* Linn.—Type locality: England) has not yet been thoroughly determined. In the new B. O. U. List of Birds it is evident that it has not been kept separate from the African subspecies. It breeds throughout Europe and visits north Africa in winter. It will probably be found not to extend south of Morocco. Hartert (Nov. Zool. xxiv. p. 268) accepts the following as its range: Europe generally from Norway and Russia to the Mediterranean, eastwards to Turkestan, northern Africa north of the Sahara, chiefly migrating in northern area.

G. c. brachyptera [*Stagnicola brachyptera* Brehm, Vogelfang, 1855, p. 331—Type locality: "Mittelafrika"], on the other hand, ranges throughout Africa generally except Egypt (*cf.* C. Grant, Ibis, 1915, p. 48). It also occurs on the islands of St. Thomas and Annobon (*cf.* Ibis, 1915, pp. 116 et 233); also on the Seychelle Islands (*cf.* Hartert, Nov. Zool. xxiv. p. 268).

Fulica atra atra. Coot.

Fulica atra Linn. Syst. Nat. 10th ed. 1758, p. 152—Type locality: Sweden.

The Coot is a **Winter Visitor** to the islands in small numbers.

It is said by natives to have bred in the Charco of Maspalomas and probably in the pools of Arguineguin in Gran Canaria, and thus reported by von Thanner who saw two pairs there in February 1909 (Orn. Jahrb. 1910, p. 100). It is worthy of note, however, that when I visited the Charco in February 1912, I failed to identify a single bird, ideal though the conditions undoubtedly are in this district (Ibis, 1912, p. 573). The Coot is mentioned as early as 1799 by Viera in his Diccionario as occurring and breeding in Gran Canaria (*cf.* Reid, Ibis, 1888, p. 76). It was recorded from this island by Bolle, who mentions seeing it in the Léon collection (J. f. O. 1857, p. 340). Earlier than this it has been recorded from the Canary Archipelago by Webb and Berthelot in 1841 (Orn. Canarienne, p. 40). Tenerife is however the island to which the Coot usually comes, Bolle first recording it in 1857 (*l. c.* p. 340) from the Binna collection. Savile Reid saw a bird alive in February which had been captured near Tacaronte (Ibis, 1888, p. 77)

Meade-Waldo believed it to be a regular winter visitor to all the islands, and records having seen several "walking about on the roofs of the houses at Orotava" (Ibis, 1893, p. 202). On rare occasions, as Cabrera says, it may be considered quite abundant in Tenerife. He had several skins in his collection (Catálogo, p. 61).

The Coot probably visits most of the other islands in the Canary group, but we only find it recorded from Hierro, Fuerteventura, and Lanzarote. The only record from Hierro is supplied by Meade-Waldo, who when he visited the island in November 1889 was shown a live Coot which had been caught a few days previously (Ibis, 1890, p. 431). In Fuerteventura Bolle notes that it comes to the pools formed in the rainy season (J. f. O. 1857, p. 340), and while in Lanzarote in 1913 I myself saw a Coot which had recently been shot in the island, in the Gonzalez collection (Ibis, 1914, p. 63).

Range. The Coot, which breeds throughout Europe, extending eastwards to China and Japan, visits north Africa in large numbers in winter, a few travelling as far south as the Canary Archipelago. I am not aware that any have been taken south of these islands. According to Ogilvie-Grant the Coot breeds in the Azores, and it is probable that these birds are non-migratory. Whether, on rare occasions, this takes place in the Canary Islands has yet to be proved.

Family COLUMBIDÆ.

Columba junoniæ *. Canarian Laurel Pigeon.

(*Columba laurivora* auctorum.)

Columba junoniæ Hartert, Nov. Zool. xxiii. 1916, p. 86—Type locality: Palma, Western Canary group.

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* I agree with Hartert that Webb and Berthelot (Orn. Canarienne, 1841, p. 26) renamed the Madeiran Laurel Pigeon *C. laurivora* and that this must therefore become a synonym of *C. trocaz* and can no longer be used for the Canarian Pigeon.

A **Resident** species.

Hab. in Archipelago.

Western Group: Palma, Gomera.

Range beyond the Archipelago.

Does not occur.

Columba bollei. Bolle's Pigeon.

Columba bollii Godman, Ibis, 1872, p. 217—Type locality: Tenerife.

A **Resident** species.

Hab. in Archipelago.

Western Group: Tenerife, Palma, Gomera.

Obs. Bolle's Pigeon was at one time resident in Gran Canaria, but disappeared with the laurel forest, probably about the year 1888.

Range beyond the Archipelago.

Does not occur.

Columba livia canariensis. Canarian Rock-Pigeon.

Columba livia canariensis Bannerman, Ibis, 1914, p. 270—Type locality: Gran Canaria.

A **Resident** subspecies.

Hab. in Archipelago.

Western Group: Gran Canaria, Tenerife, Palma, Gomera, Hierro.

Eastern Group: Fuerteventura, Lanzarote.

Outer islets: Lobos, Graciosa, Montaña Clara, Alleganza.

Range beyond the Archipelago.

Does not occur.

Streptopelia turtur turtur. Common Turtle Dove.

Columba turtur Linn. Syst. Nat. 10th ed. 1758, p. 164—Type locality: England.

The Turtle Dove is a regular **Summer Visitor** in considerable numbers to the Canary Islands.

Early writers, Ledru (1810, vol. i. p. 184), Webb and Berthelot (Orn. Canarienne, 1841, p. 28), and Bolle in his first paper (J. f. O. 1855, p. 173) confused the Turtle Dove which came regularly to the islands with *Chalcopelia afra* (Linn.). Bolle in his last contribution (J. f. O. 1857, p. 331) corrected his mistake, but fell into the error of believing there were two species of Turtle Doves breeding in the Archipelago—*Streptopelia t. turtur* in the western group. and *Streptopelia* (*Turtur*) *senegalensis* (Linn.) in Fuerteventura.

There is, however, only one species found breeding in the Canary Islands, and this is the form here recorded. To this species the notes of all former writers must apply. I have myself camped on the Manrique's property* at La Peña, which swarms with Turtle Doves, but they are all *Streptopelia turtur turtur* as in the western islands.

The Turtle Dove arrives in the Canary Islands in spring, the first recorded date being March 13 when von Thanner noted (Orn. Jahrb. 1910, p. 98) an arrival of this species in the south of Gran Canaria, this being an exceptionally early date.

Polatzek noted (Orn. Jahrb. 1909, p. 13) the first arrivals on 2nd of April, 1902, in Lanzarote, but according to this observer these birds passed through the island, while the breeding birds followed later—probably these birds passed on to the western islands of the Archipelago.

Meade-Waldo procured birds in Fuerteventura near Santa Catarina on the 28th of March (MS. note-books); and Bolle found them especially numerous at Jandia in that island in April (J. f. O. 1855, p. 173).

Webb and Berthelot considered that the Turtle Dove did not arrive until after May or sometimes at the end of June (Orn. Canarienne, p. 28).

If this was the case between 1828 and 1830 it certainly is not so at the present day. April is probably the month when most of the breeding birds arrive.

The Turtle Dove breeds in all the large islands, but appears to be specially numerous in Gran Canaria and Tenerife; here it frequents the orchards, sheltered barrancos, and even private gardens, and builds its nest in palms, tamarisks, fruit-trees, pomegranate bushes, and once according to Polatzek (Orn. Jahrb. 1909, p. 13) in the peculiar *Euphorbia canariensis.*

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* The estate mentioned by Bolle.

I have taken fresh eggs in Fuerteventura on the 11th of May, and young birds just fledged and unable to fly were obtained in Lanzarote on the 26th of May, in which island the bird appears to be practically confined to the valley of Haria (Ibis, 1914, p. 273).

The Turtle Doves remain in the islands throughout the summer, and as the time for departure approaches they congregate in flocks. In Tenerife the doves are said to gather on the coast in large numbers. Webb and Berthelot mentioned the promontory Montaña Raja as a favourite spot upon which the Turtle Doves assembled before quitting this island (Orn. Canarienne, p. 28).

The birds depart in November (Polatzek, *l. c.*), but as already noted a very few are said to remain in the eastern islands through the winter. Webb and Berthelot mention having shot odd birds in every month of the year, and Meade-Waldo likewise mentions that "a few spend the winter in the eastern islands" (Ibis, 1893, p. 200). This may occasionally be the case, but I doubt whether it is so except on very rare occasions.

Floericke's remarks (A. d. Heimat d. Kanarienvög. 1905, pp. 85, 86) on the Turtle Dove are quite untrue, and the explanation of his assertion that it is a Resident bird is given by Polatzek, who has taken some pains to show up the unreliable part of Floericke's work (Orn. Jahrb. 1909, p. 14).

Range. The typical Turtle Dove (*S. turtur turtur*) breeds in Europe from Norway and Sweden and north Russia to the Mediterranean countries and western Asia. Many visit north Africa in winter, but it is uncertain how far down the west coast the typical bird wanders. Measurements show that the Turtle Dove of the Canary Archipelago is on the average slightly smaller than typical examples, but I agree with Dr. Hartert that this is not sufficient ground upon which to found a new race, particularly as the Canarian Turtle Dove is only a Summer Visitor and not a Resident.

Streptopelia turtur arenicola. North African Turtle Dove.

Turtur turtur arenicola Hartert, Nov. Zool. i. 1894, p. 42 —Type locality: Fao (Persian Gulf).

This North African Turtle Dove is a very **Rare Visitor**, which has occurred on one occasion only in the Canary Islands. A bird was shot by myself in company with the typical species in a field near Las Palmas, Gran Canaria, on the 5th of May, 1913, and duly recorded in 'The Ibis,' 1914, p. 274.

The specimen has been twice examined by Dr. Hartert and once by Lord Rothschild, who consider it to be unquestionably an example of *S. t. arenicola* "which must have been out of its range—a straggler only."

Range. Dr. Hartert has kindly allowed me to make use of his unpublished MSS. and he accepts the following as the range of *S. t. arenicola*:—Persia, Buchara and Turkestan to Yarkand, Kashgaria, Afghanistan, Transcaspia, Palestine, Lower Egypt and rest of north Africa from Tripolitania to Morocco, south to the oases of the north-western Sahara, as far as Ghardaïa and Ouargla, probably also still nesting in El-Golea. Migratory in north-west Africa but winter quarters not yet known.

Family PTEROCLETIDÆ.

Pterocles orientalis. Black-breasted Sand-Grouse.

[*Pterocles arenarius* (Pallas), auctorum *.]

Tetrao orientalis Linn. in Hasselquist's Iter Palæstinum, 1757, p. 278—Type locality: Anatolia (Western Asia Minor, probably near Smyrna).

A **Resident** species.

Hab. in Archipelago.

Eastern Group: Fuerteventura.

Obs. Occasionally used to be seen on the plains in the south-east of Gran Canaria; it does not breed there and has not been noticed since 1856 (Bolle, J. f. O. 1857, p. 332).

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* For reasons why *arenarius* of Pallas must be discarded in favour of *orientalis* Linn., see Hartert, Nov. Zool. xxiv. 1917, p. 284.

Range beyond the Archipelago.

Northern Africa, including the Sahara, in Mediterranean countries of Europe especially Spain and Portugal, also in south-east Russia. In Asia it occurs from Palestine to north-west India.

Family Phasianidæ.

Caccabis rufa. Red-legged Partridge.

[or **Caccabis rufa australis.**

Caccabis rufa, var. *australis* Tristram, Ibis, 1889, p. 28—Type locality: Gran Canaria.]

A **Resident** subspecies.

Hab. in Archipelago.

Western Group: Gran Canaria.

Range beyond the Archipelago.

C. r. australis does not occur elsewhere (if this race is accepted).

Obs. The validity of this subspecies is still in question, only more material can decide the point.

Caccabis barbara kœnigi.** Kœnig's Barbary Partridge.

Caccabis petrosa kœnigi Reichw. Orn. Monatsber. 1899, p. 189—Type locality: Tenerife.

A **Resident** subspecies.

Hab. in Archipelago.

Western Group: Tenerife, Gomera.

Eastern Group: Lanzarote.

Obs. Webb and Berthelot say that it also inhabits Hierro (Orn. Canarienne, p. 29). It has not been recorded from that island since they wrote in 1841. In Lanzarote it is very rare and is confined to one locality.

Range beyond the Archipelago.

Does not occur.

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* *Caccabis barbara* (Bonnaterre) [Tabl. Encycl. et Méth. i. 1791, p. 208] is the correct specific name of the Barbary Partridge.

Coturnix coturnix coturnix. Migratory Quail.

Tetrao coturnix Linn. Syst. Nat. 10th ed. 1758, p. 161—Type locality: Sweden.

The Migratory Quail is, as its English name implies, a **Bird of Passage** in large numbers. It is also a **Summer Visitor** and may prove to be a Partial Resident. Unfortunately it has been so confused with the Resident Quail that it is very difficult to arrive at the exact status which it has in the islands.

The Quail has long been known as a very plentiful species in the Canary Islands. Bethencourt speaks of "a marvellous number of Quail" and it is mentioned by Ledru in 1810 (vol. i. p. 184) from Tenerife. The older writers * did not, however, realise there are two races of the Quail in the Archipelago, the migratory and an island form which until recently has been confused with the African Quail, and their accounts therefore do not always agree. The island race has recently been named by Hartert *C. c. confisa* (Nov. Zool. xxiv. 1917, p. 423—Type locality: Madeira).

It would appear to arrive in the Archipelago very early in the spring—sometimes as soon as the end of January. According to Meade-Waldo numbers arrive in February and they begin to breed then near the coast (Ibis, 1889, p. 517).

The Quail breeds in all the large islands apparently, and according to Polatzek (Orn. Jahrb. 1909, p. 14) remains longer in the western than in the eastern group. This looks to me as if only the Migratory Quail was found in the eastern islands, the Resident Quail (*C. c. confisa*) occurring only in the western islands.

That the Migratory Quail visits Fuerteventura and Lanzarote in much larger numbers in rainy years than in dry years, is shown by von Thanner, who remarks (Orn. Jahrb. 1912, p. 221) when he visited Fuerteventura in the spring of 1912: "after the abundant rain Quails ('Wachteln') which during the dry years were never seen came in great numbers . . ." Von Thanner was in Lanzarote in May 1913, and says (Orn. Jahrb. 1913, p. 189): "During our travels we always heard the Quail in the fields."

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* Meade-Waldo seems to have been the first ornithologist to realise that there were two races of the Quail in the Canary Islands (Ibis, 1889, p. 517).

Bolle shot many in Fuerteventura on the stubble fields after the harvest which occurs there in April (J. f. O. 1855, p. 173).

Webb and Berthelot give a long account of the Quail in Tenerife. Of its migrations they observe: "Nous ne saurions assurer si la Caille est de passage aux Canaries, ou bien si elle y est réellement sédentaire. L'opinion des chasseurs de Ténériffe est partagée à cet égard. Toute fois, nous pensons qu'il en est pour cet oiseau comme pour d'autres espèces, que son émigration n'est pas générale. L'apparition des Cailles voyageuses doit avoir lieu au printemps, quoique nous ne l'ayons pas constatée . . . . .

"Le depart des Cailles pour d'autres régions s'effectue probablement au commencement de l'automne; et bien qu'elles aient abandonné à cette époque les champs labourés, on en entend chanter encore de temps en temps dans les halliers pendant les belles journées d'hiver." (Orn. Canarienne, pp. 29, 30.)

It will be seen that these authors mention August and September as the best months for shooting them and that the departure takes place probably at the commencement of autumn. The migration from the islands is as usual not so marked as the arrival.

Bolle's notes here obviously refer to both species. He wrote (J. f. O. 1855, p. 173): "They say that part of them leave the country in winter" (this obviously refers to *C. c. coturnix*), and continues "and the rest—by far the greater number—remain" (thus referring to what must be *C. c. confisa*).

Bolle notes that the principal shooting season in Tenerife is September and October, putting it a month later than Webb and Berthelot, so that the migratory birds probably leave the Archipelago in November, being absent barely two months.

According to Meade-Waldo the Quail rears two or three bevies of young in the year (Ibis, 1893, p. 201).

Von Thanner was assured that the Quails left the island of Fuerteventura directly after breeding but returned again in the autumn (Orn. Jahrb. 1905, p. 62). This may refer to *C. c. confisa* only.

Whether some of the typical birds remain in the Archipelago during the entire winter is not yet known, but I should think it highly probable that such is the case, especially as the resident birds (*C. c. confisa*) probably interbreed with the migratory, as instanced by birds which I obtained at Firgas in Gran Canaria in June 1913 (Ibis, 1914, p. 292).

In dealing with the migrations of the Quail in the Canaries we must bear in mind the fact that the resident form has been greatly confused with the Migratory Quail, and also that local migration of the resident form may take place between the islands and thus add to the confusion. Specimens must be shot and preserved from all the islands at all seasons before we can safely write about the migrations of this species.

Range. Hartert has recently gone very fully into the question of the races of *Coturnix coturnix* (Nov. Zool. xxiv. 1917, pp. 420-425). He accepts the following for the range of the typical Migratory Quail: "Europe to Yenesey and Lake Baikal, south to Morocco, Algeria, Tunisia, Egypt, and Persia, also in small numbers nesting in north-west India, wintering chiefly in northern tropical Africa south of the Sahara (south to Gambia and Abyssinia), in Arabia and India."

It will be a stream of the birds which pass down the west coast of Africa to Gambia, which pass regularly through the Canaries on migration.

Coturnix coturnix confisa. Quail.

Coturnix coturnix confisa Hartert, Nov. Zool. xxiv. 1917, p. 423—Type locality: Madeira.

A Resident subspecies.

Hab. in Archipelago.

Western Group: Gran Canaria, Tenerife, Palma, Gomera, Hierro.

Eastern Group: Doubtful if occurs.

Obs. The status of the Resident Quail in the Canaries is very difficult to determine. It has until recently been confused with *C. c. africana* and by all the older writers with *C. c. coturnix.*

Whether or not it occurs in the eastern Canary Islands I have been unable to determine. My own opinion is that it is probably confined to the higher western islands. Proof of this is wanting. The question is more fully dealt with under the preceding species.

Range beyond the Archipelago.

Madeira.

[To be continued.]

III.—*Notes on the Birds of Quetta.*

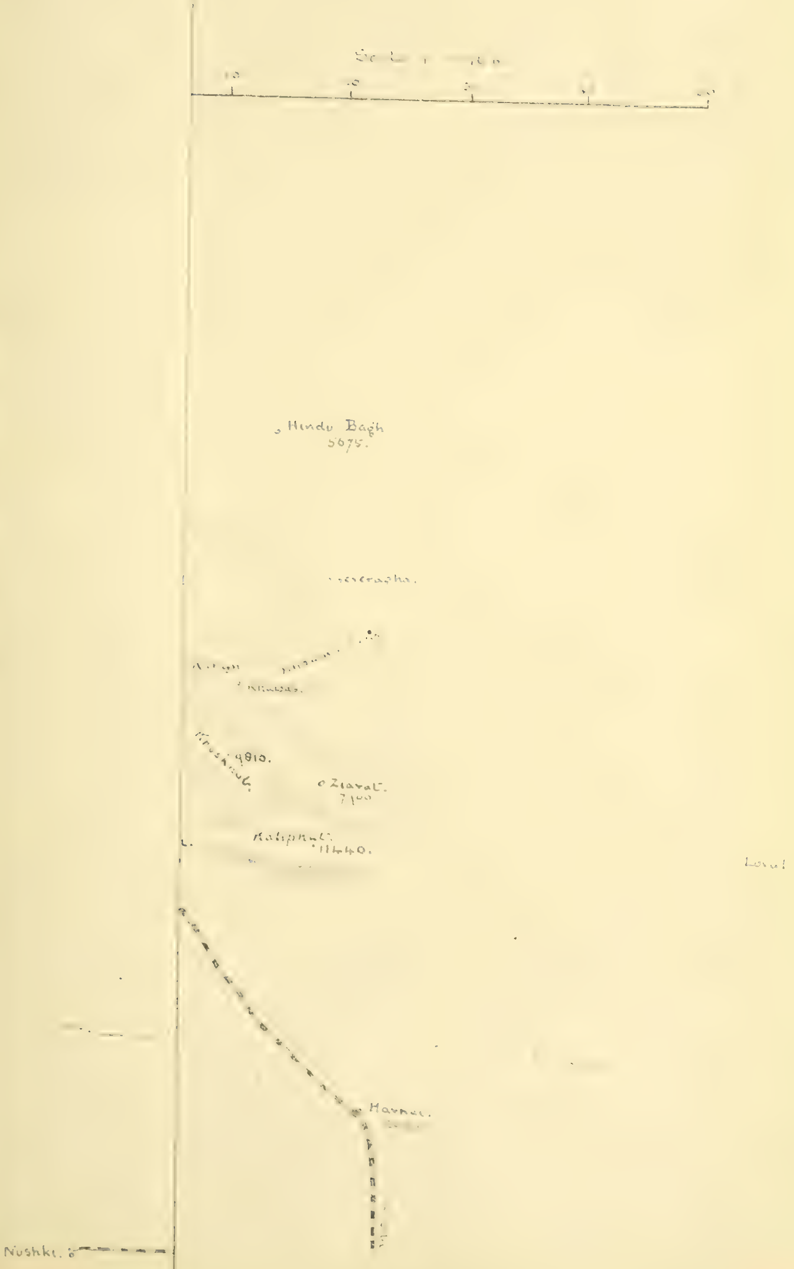
By Colonel R. MEINERTZHAGEN, M.B.O.U.

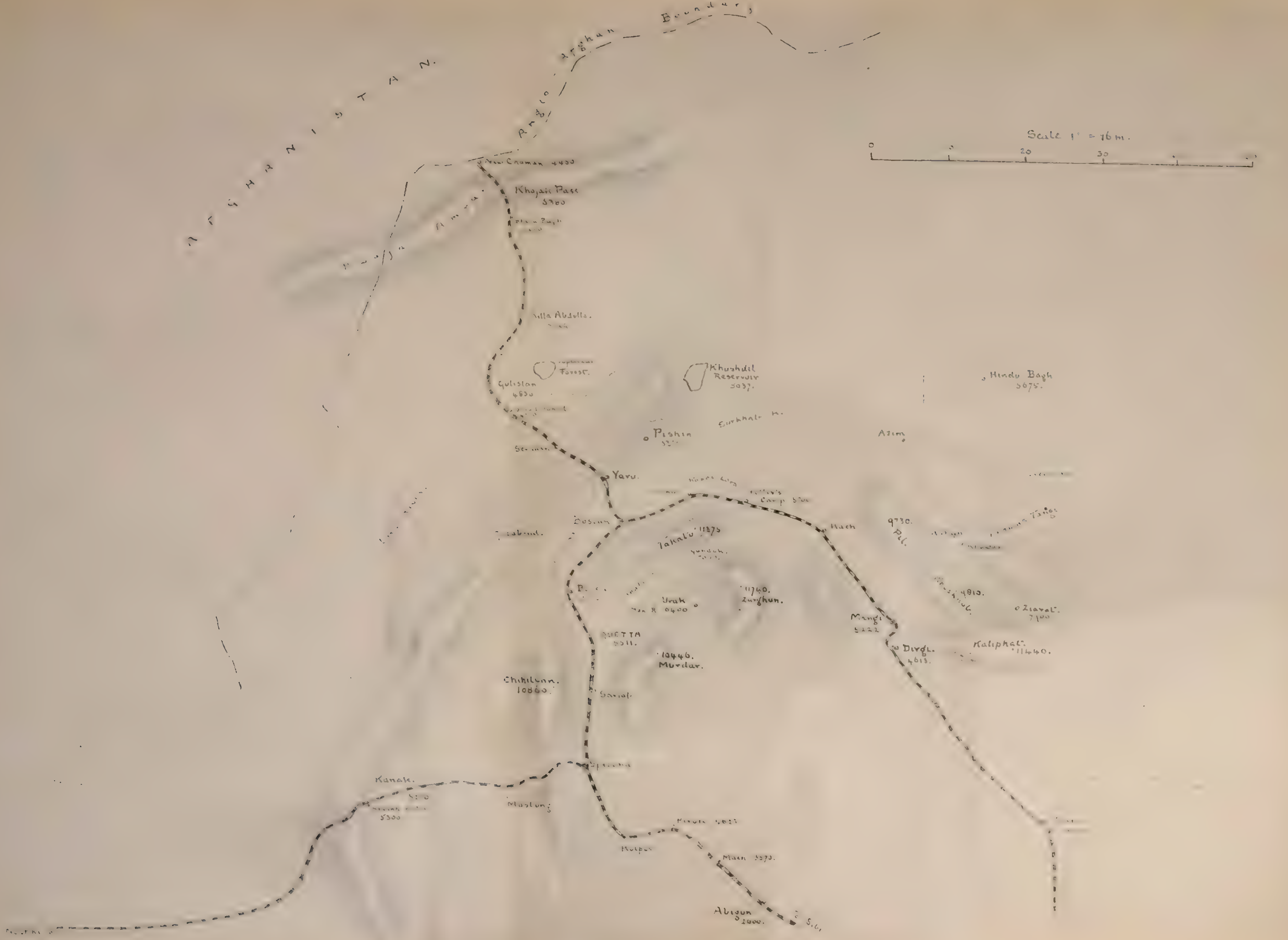
(Plate I.—Map.)

THE following notes represent an endeavour to bring up to date the list of birds that have been obtained at or near Quetta at various times. During a residence of nearly two years I had frequent opportunities of visiting almost every portion of the country in the vicinity, and of making the small collection which forms the basis of these notes.

Quetta lies in the highlands of Baluchistan, and though the larger part of the surrounding country is waterless and bare, there are many spots, not only in the hills but in the plains, where thick forest, mountain torrents, fern-clad ravines, and other attractive localities exist.

In the plains, the rivers have cut for themselves deep marshy beds in the soft alluvial soil. In and at the base of the hills nearly all the river-beds are dry, only to contain raging torrents after heavy rain. The huge masses of mountains, rising to over 11,000 feet in places, are covered with juniper, wild briar, and other vegetation, whilst round


Hindu Bagh
5675.
9810.
Ziarat.
7100
Khalifat.
11440.
Harnai.
Nushki.


AFGHANISTAN.
Anglo-Afghan Boundary
Scale 1" = 16 m.
0
20
30
New Chaman 4450
Khojak Pass
5380
Khwaja Amran
Killa Abdulla.
Forest.
Gulistan
4830
Khushdil
Reservoir
5037.
Hindu Bagh
5075.
Surkhab R.
Pishin
Asim
Yaru.
Camp Stn.
Bostan
Takatu 11375
Kach
9730.
Pil.
11740.
Zarghun.
Urak
4810.
Ziarat.
7100
Mangi
5222
QUETTA
5511.
10446.
Murdar.
Dirgi.
4613.
Kaliphat.
11440.
Chiltan.
10860.
Sariab
Kanak.
Mastung
Kolpur
Mach 5573.
Abigum
2000.
Sibi

Ziarat a dense juniper forest exists. From a distance, such hills as Takatu and Murdar look bare and lifeless, but in reality the vegetation is in places luxuriant and full of bird-life; while, except in these hills, animals during the summer are comparatively scarce, and the number of purely resident species is small; it is when the spring and autumn migrations set in that bird-life is varied and abundant.

Quetta apparently lies on a main migration route, and, as far as I was able to judge, this route lies N.W. and S.E. From observations made of Ducks, Bee-eaters, Larks, and other species there is little doubt of this, though birds are naturally seen migrating in all directions at times. Valleys lying at right angles to this line of migration are comparatively poor in bird-life, whilst valleys parallel to the line are full of it. Migration at Quetta starts early and ends late. In early August the first arrivals appear, while many birds, as yet unknown to breed within Indian limits, are still to be found in late May. It looks as though Quetta was the last halting-place before the final dash to northern climes.

Then there is the local migration from high to low altitudes. It is as regular as the latitudinal migration. The Missel Thrush, Red-billed Chough, several Hawks, and many other species appear to make their local move every winter, returning only a few miles to their breeding haunts every spring, by an ascent of some 5000 feet.

From November to early March the hills are snow-clad, and little bird-life remains except in the juniper forests, though I was never able to find out whether *Trochalopterum lineatum* migrates or not. It seems unlikely that such a delicate bird could brave out a blizzard, so frequent in a Baluchistan winter. Quetta itself is under snow nearly every February, and throughout the winter it is colder there than on average in England.

No one can help noticing the European character of the birds. It is no uncommon thing to walk all day round Quetta in the winter and see nothing but a few Missel Thrushes, Magpies, Rooks, Snipe, perhaps a Woodcock, Bramble Finches, and other such familiar English birds. Quetta is, moreover, one of the few parts of British India where the Black Kite and Egyptian Vulture are permanently resident. None of the purely Indian Ducks occur, and the familiar Indian birds are absent. The fact is, Baluchistan is not India—it is Persia; and therefore there can be small wonder that so many birds are to be found breeding round Quetta which do so nowhere else within Indian limits.

I am aware that there is still much to be done at Quetta in this line. Further migration observations would be well repaid. A visit to the juniper forests or to some of the large reed-beds in the breeding-season might produce some hitherto unrecorded specimens and eggs. A close watch on migrants will reveal species new as yet to India. Many were the birds I saw but could not obtain or identify, and I found two Warblers' nests and eggs, which certainly did not belong to any of the species enumerated below. Surely if the Bittern and Eared Grebe, Upcher's Warbler and the Allied Grey Shrike, are found breeding, others of equal interest are there, only awaiting discovery.

But the ornithologist at Quetta requires plenty of leisure at his disposal. As a student at the Staff College I was unable to devote as much time as I desired to birds, and I failed to secure specimens of some of the resident species.

My thanks are due to the authorities of the Macmahon Museum at Quetta for the use of their collection and library, and to Dr. Hartert for help in identifying certain geographical races.

Throughout this paper the day of the month is shown thus:—12. iv. = April 12th. Bill measurements are those of the culmen, *i. e.* from the base of the skull.

Corvus corax.

C. c. laurencei Hume.

An abundant resident, nesting in the hills and in rocks and precipices bordering on the Quetta Plain, but mostly in the more inaccessible parts of the higher mountains. In the cold weather the birds congregate in large flocks round Quetta and can be seen roosting in the poplars in the cantonments, whereas in the hot weather they invariably return to the hills to roost. I did not detect any more than the "hill to plain" migration in this race, and I doubt whether strangers from other parts visit Quetta in winter.

The breeding-season commences in early March, and full clutches can be found after the middle of that month. Marshall found one of six on 24. iii. (B. N. H. S. Oct. 1902).

Of six birds obtained, the wing in three males varied from 419 to 448, and in three females from 399 to 430 mm.

In the spring and summer this bird may be frequently seen sitting on roofs croaking out his love song, but often intermingled with a metallic bell note which is by no means unpleasant though somewhat monotonous.

C. c. ruficollis Lesson. (=*umbrinus.*)

An uncommon winter visitor, arriving in early November. The birds appear to have slightly less brown on the plumage than typical specimens, a longer and more slender bill, and a smaller wing-measurement, and, in fact, would appear to be small hill-forms of *C. c. ruficollis* ; but these differences are neither constant nor always apparent. It is possible these birds belong to "*infumatus*," the type of which I have been unable to examine.

Corvus frugilegus.

C. f. frugilegus L.

A winter visitor in large flocks, but scarce in some years. It usually arrives about the middle of November and leaves again in March. Not being yet satisfied as to the validity of *C. f. tschusii* Hart. as a good race, I prefer placing these birds under the typical form, though it is recognised that in many cases Indian birds have a slender bill.

Colœus monedula.

C. m. collaris (Drummond).

Rare winter visitor. One seen with a flock of Rooks on 12. xii., and one in the Quetta Museum was obtained at that place on 30. x.

Pica pica.

P. p. bactriana.

Locally common and resident, ascending in summer to over 8000 feet, a few breeding in the plains. Fresh eggs found on 10. iv., 27. iv., and 3. v., and fully fledged young on 11. vi. Birds are in full moult at the end of July.

The amount of white on the primaries is very variable, as is the length of the wing.

Pyrrhocorax pyrrhocorax (L.).

A common resident, breeding at high altitudes and descending to the plains in flocks in cold weather, when it becomes tame and is an unceasing joy to watch. A small party of four pairs was found nesting on Takatu at 10,000 feet on 10. v. in cracks in an inaccessible cliff.

No specimens were obtained, but several in the Quetta Museum were examined.

Reports of the Yellow-billed Chough occurring at Quetta so far lack confirmation, and I doubt its existence in Baluchistan, for I more than once searched the summits of Takatu, Murdar, Kaliphat, and Zarghun for it.

Sturnus vulgaris.

S. v. poltaratskyi Finsch.

S. v. nobilior Hume.

I obtained four specimens of *poltaratskyi* and two of *nobilior*, all of which I have compared with specimens at Tring and in the British Museum. I was fortunate in securing birds of both races in breeding-plumage on 31. iii. and 14. ii.

Starlings appear in small flocks from October and remain till early April. None breed. Doubtless in a larger series we would find further races wintering at Quetta. Marshall records *humii* from Quetta in March and April.

Pastor roseus (L.).

The status of this species in Baluchistan is puzzling. It does not occur in mid-winter. In spring, from the end of

March to the middle of May, small parties can be seen. I saw a pair at 9000 feet on 7. vi. Large flocks of birds of the year were seen near Ziarat at an altitude of above 7000 feet from 14. vii. to 2. viii. in two successive years, and small flocks of adults and young appeared in the Quetta Plains on 10. vii. A female obtained on 8. vii. at Ziarat had lately been sitting on eggs. It is possible that they nest in some of the hills of northern Baluchistan.

Oriolus oriolus.

O. o. kundoo Sykes.

A summer visitor in small numbers, arriving in late April and nesting in orchards and gardens, my first eggs being found on 11. v. They leave Quetta in August, and even in summer are seldom found above 6000 feet.

Coccothraustes coccothraustes.

C. c. humii Sharpe.

A male obtained at Quetta on 1. iii. was the only one seen, and there are none in the Quetta Museum. Though reported to be common and resident at Chaman I never saw it there.

Mycerobas carnipes (Hodgs.).

A common resident in the hills, feeding on juniper berries and collecting into small parties in winter, but never descending to the plains. A nest found on 7. vi. at 11,000 feet contained four eggs. The nest was a large cup-shaped structure composed of small twigs and coarse grass, lined with fine fibre, and placed on the branch of a juniper five feet from the ground. The eggs were dull white with bold streaks of dark brown round the larger end.

These birds are very noisy when feeding, but if alarmed will sit motionless and silent in a bush. If hunted out they scatter in all directions with clumsy dipping flight, and do not stop their rasping alarm-note till the party is reunited.

Carduelis carduelis.

C. c. major (Tacz.).

A pair of these northern birds was seen in a flock of *C. caniceps* at Quetta on 27. ii. and one was secured. They compare well with birds from western Asia.

Carduelis caniceps.

C. c. orientalis (Eversm.).

A winter visitor in fair numbers, arriving in early November and leaving again in early March. A pair was, however, seen on 22. iv.

Acanthis cannabina.

A. c. fringillirostris (Bp. & Schleg.).

A cock in full breeding-plumage was obtained on 2. iv., a male in the Quetta Museum on 31. iii. A large flock of Linnets seen at Quetta on 14. ii. were probably of this race. Obviously a rare winter visitor.

Serinus pusillus (Pall.).

A common nesting species at Ziarat (8000 feet) and on Murdar at 10,500 feet, descending in severe weather to the plains in flocks. A nest found on Zarghun at 9500 feet on 10. v. contained one egg, and was placed on a wild oleander bush three feet from the ground. It was made of grass and lined with cotton and feathers.

Erythrospiza githaginea.

E. g. crassirostris (Blyth).

Rare and local. One was obtained at Khushdil on 11. vii., when several others were seen which were doubtless breeding. Others were seen near Quetta at Azim on 12. vi.

Rhodospiza obsoleta (Licht.).

Resident in small numbers in the Quetta Plains, their numbers increased in spring by summer visitors which arrive in late March. In winter they are to be found in flocks of about twenty, and in spring they scatter to nest in gardens, &c. A nest found on 4. v. with two eggs was in a vine six feet from the ground, and one with four eggs in a climbing rose seven feet from the ground, the structure being large, made of grass and lined with feathers in each case. The eggs were pale greenish white, with a few dark brown and purplish spots at the base.

Carpodacus rhodochlamys.

C. r. grandis Blyth.

A fairly common resident in the hills up to 11,000 feet, descending lower in winter. Birds were in full moult at the end of July. Ten specimens obtained in April, May, July, and November compare well with Cashmir birds.

A nest with two eggs was found at 9500 feet on 3. v. and another with four eggs at 11,000 feet on 10. v. Fully fledged young being fed by their parents were noted on 7. vi. The nests were in wild briars three and five feet from the ground, were cup-shaped and made of grass and bark, lined with fine fibres and a few hairs. Eggs pale blue with a few evenly distributed brown spots.

Carpodacus erythrinus.

C. e. roseata (Hodgs.).

A male in the Quetta Museum was obtained at Ziaraton 6. ix., while Marshall says that the birds are common there in May. I frequently saw them round Quetta in summer, but failed to secure a specimen.

Uroloncha malabarica (L.).

Large flocks observed at Khawas (7500 feet) on 31. vii., out of which I obtained a cock. Another was shot at Kahan on 1. viii. Specimens in the Quetta Museum were obtained there on 9. vii. A nest was found by Cumming in a vine at Baleli on 16. viii.

Sporæginthus amandava (L.).

A small flock was seen near Quetta in August, and several in October and November. A specimen was obtained on 18. x.

Fringilla montifringilla.

F. m. montifringilla L.

An abundant winter visitor in large flocks, arriving about early November and leaving in late March. Latest date 2. iv. Birds are in full breeding-plumage before moving north.

Petronia petronia.

P. p. intermedia Hart.

A female in the Quetta Museum was shot near the town on 14. iii. I never observed the birds, and they must be very rare stragglers only.

Gymnorhis flavicollis.

G. f. transfuga Hart.

A female was obtained on 2. iii. from a small flock. Not otherwise observed.

Passer domesticus.

P. d. indicus Jard. & Selby.

Three were obtained in March and April.

A summer visitor to towns and villages in northern Baluchistan, the first arrivals being noted in large flocks on 17. iii. These flocks keep to the hill slopes and do not approach the towns for a few days, and it is curious that when out on the hills they are very wild, but become tame at once on entering the inhabited areas, when a fight with the resident Tree-Sparrows at once commences. Nesting begins towards the end of April; the first egg was found on 30. iv. and full clutches were obtained after 8. v. The birds depart in late August and early September.

I twice found nesting colonies in earth-banks, and once in a cliff at 10,000 feet.

Passer hispaniolensis.

P. h. transcaspicus Tschusi.

None observed, but there are three birds in the Quetta Museum obtained locally on 18. xi. Watson (B. N. H. S. xv. p. 145) reports large flocks at Chaman from October to December.

Passer montanus.

P. m. dilutus Richm.

An abundant resident. Three obtained in January, May, and December agree with Turkestan specimens.

Fresh eggs were found from 2. iv. to 4. vi., and all nests were near or in human habitations. This species does not ascend beyond 7500 feet. In winter it commonly roosts in bushes and creepers close up against houses, and appears to be able to withstand even a blizzard.

Emberiza leucocephala Gm.

A fairly common winter visitor in small parties of from four to ten, first arrivals noted 9. xi. and latest seen and obtained on 28. iv.

Emberiza melanocephala Scop.

Only once seen, on 2. viii., when I obtained two adult males at Quetta from a party of nine. Curiously enough, the only specimen in the Quetta Museum was shot on the same date of the previous year.

Emberiza icterica Eversm. (=*luteola.*)

Found locally in summer though it probably leaves in winter, but I am not certain of this. Breeds commonly near Ziarat, and probably nests near Baleli and other places in the plains. Four obtained from 14. iv. to 29. vii.

Emberiza stewarti Blyth.

An abundant summer visitor, breeding freely between 7000 and 9000 feet. First arrivals noted 4. iv. and last seen 17. x. It is possible that a few remain for the winter.

A nest with two eggs was found on 10. v. and one with four on 10. vi. Both were on the ground on a bank, were constructed of grass and fibre and were unlined. In the first nest the eggs were white, mottled and streaked with reddish brown and purple. In the second they were white, with only a few hair-streaks and mottling.

Young able to fly were seen on 26. vii,

Emberiza buchanani Blyth.

A scarce summer visitor, arriving in the middle of March and not observed after September. Prefers the foot-hills where low bushes and rocks prevail. A nest found on 9. v. contained one egg, dull white with brown and russet mottling and streaks. Another, found on 11. vi., contained four eggs, dull white with russet mottlings and black hair-streaks at the base. In both cases the nest was ill-concealed under a small tufty bush, and was made of grass and was unlined. Another with four newly-hatched young was found on 30. v.

These birds were usually noticed between 5500 and 8000 feet.

Emberiza cia.

E. c. par Hart.

A single female, the only one seen, was shot on 11. iii. Four birds obtained near Quetta in November, December, and February are in the Quetta Museum.

Probably a rare winter visitor.

Emberiza striolata.

E. s. striolata (Licht.).

A solitary male obtained on 11. ii. was the only specimen observed.

Melanocorypha bimaculata.

M. b. bimaculata (Menetr.).

Twice obtained from small flocks—on 4. iii. and 20. xi. A male in the Quetta Museum was shot on 6. iii., and another was obtained by Lindsay on 28. xi.

The bird is probably a scarce bird of passage.

My examples are identical with Turkestan birds.

Calandrella brachydactyla.

C. b. longipennis (Eversm.).

A winter visitor in large flocks from late October to late March. Three obtained in January and March compare well with the series at Tring.

Calandrella acutirostris.

C. a. acutirostris Hume.

Eight examples were obtained from 17. ii. to 2. viii., but it does not remain as a rule in winter. Fairly common species, though local and confined to the valleys of the foot-hills, where it breeds in small colonies of half-a-dozen pairs. Three nests were found—on 10. v. with one egg, on 31. v. with four eggs, and on 8. vi. with four eggs, two being at 7000 feet and one at 9000 feet. They were small grass-lined scrapings, two in the open and one under a tuft of grass, and were constructed of coarse grass with cotton lining. In two cases the eggs were white with numerous light brown spots, most frequent at the base, while in the third instance the eggs had a well-defined ring of spots at the larger end. Average measurement of nine eggs: ·78 by ·59 inch.

Ammomanes deserti.

A. d. iranicus Zarudny.

A common resident in suitable places, preferring broken ground with no vegetation, but never ascending the hills to any height. Two nests were found—one on 1. v. with four eggs and another on 17. v. with three eggs. Both were under small stones, and were composed of coarse grass-stalks with a lining of finer grass. Eggs milky white, profusely covered with grey and brown spots.

This form agrees well with specimens at Tring from the type-locality in East Persia. They appear darker than *A. d. phœnicuroides* on the upper parts. It would seem that the latter form is the plain form, as there are specimens at Tring from Kandahar and Seistan, whereas *iranicus* is the hill form of East Persia, South Afghanistan, and the whole of Baluchistan.

Galerida cristata.

G. c. magna Hume.

An abundant resident, but not ascending above 7500 feet.

Laying commences during the last days of April or in early May. The nests found were mere scratchings lined with grass, usually under the shelter of a small bush or stone, but sometimes in the open. They were always thinly lined with wool, cotton, or fine grass. Eggs dull white, profusely spotted with yellowish and dark brown, with occasionally a few dark streaks at the larger end. Average measurement of eight eggs: ·87 by ·65 inch.

I unfortunately brought home only one specimen, but I cannot see any difference between it and birds from South Persia and Turkestan.

Alauda arvensis.

A. a. cinerea Ehmcke.

An abundant winter visitor, commencing to arrive about the middle of November, and first noticed on 11. xi. It was still round Quetta at the end of February.

The wings of two males measured 114 and 115 mm., and of one female 100 mm.

Alauda gulgula.

A. g. inconspicua Severt.

There were a few pairs of this interesting race breeding round Khushdil Reservoir from May to July, but they were not noted at any other time or place. A nest with three eggs was found on 17. v., all being typical of the Skylark, except that there was a distinct zone of hair-lines round the larger end of the egg. The nest was placed some 150 yards from the water's edge and on almost bare earth, ill-concealed by old withered-up grass-stalks. A similar nest was found at the same place with three newly-hatched young on 11. vii., possibly a second brood.

This is a very distinct, large, and grey form of *gulgula* which has hitherto not been obtained out of Transcaspia and Turkestan. I obtained a pair which compare well with Turkestan birds at Tring. The wing of the male measures 98 and of the female 97 mm.

Alæmon alaudipes.

A. a. pallida (Blyth).

One obtained on 3. xi. must have been a straggler, as no others were seen and there are none in the Quetta Museum. It is, however, said to occur at Nushki.

Anthus sordidus.

A. s. captus Hart. (= *Anthus leucophrys captus* Hart.)

Anthus similis Oates, Fauna Brit. India.

Anthus jerdoni Cat. B. M. x. p. 562.

A common resident, ascending to 9500 feet in summer and wintering lower down. Three nests found contained two, four, and four eggs on 10. v., 23. v., and 23. v. respectively. These nests were of unlined grass, one was placed under the shelter of a small rock and the other two under tufts of grass, all being well hidden. In the first two nests the eggs were brownish white, covered almost evenly with brown and purplish spots. In the third nest the eggs were greyish white with purplish and black spots of various sizes, denser at the base, where they almost formed a zone round the larger end. The average measurement of seven eggs was ·87 by ·71 inch. A fourth nest found on 9. vi. contained a young Cuckoo (*telephonus*) and two newly-hatched Pipits, one dead chick lying within six inches of the nest. All nests were found between 7500 and 9000 feet.

In all fifteen specimens were obtained. These agree well with specimens from Palestine, whence the type was obtained. Nine males have wings varying from 97 to 105 mm.; five females have wings varying from 91 to 102 mm. Birds were in full moult in the middle of August. Of seven specimens of both sexes shot in May, six have an unspotted breast and one has the normal spotting. At other times of the year all my specimens had the normal spots.

This bird perches freely on trees and telegraph-wires, and though confined to grassy or bush-clad hill-slopes in summer, hangs about water and flooded fields in winter.

I never met with either the Tree-Pipit or Tawny Pipit near Quetta. In view of the frequency of reports to the contrary and the total absence of these birds during my two years' observation at Quetta, I cannot help feeling that they have been mistaken for the Water-Pipit in winter plumage or *Anthus sordidus captus*.

Anthus spinoletta.

A. s. coutelli Savigny.

Seven were obtained from 18. x. to 22. iii. A bird on the latter date was in full breeding-plumage.

A. s. blakistoni Swinhoe.

One obtained on 18. iii. is undoubtedly of this race.

Water-Pipits arrived in the Quetta Plains in early October, even adults being in winter dress. They remained throughout the winter, the last seen being on 1. iv. They were never in flocks, were usually to be found in small ditches in irrigated fields, and were absurdly tame.

Oreocorys sylvanus (Hodgs.).

A female of this species in the Quetta Museum was obtained near that place on 22. ix.

Motacilla flava.

M. f. beema Sykes.

A few were seen on spring passage, none in autumn. The period of passage appears to be from 16. iii. to 20. iv. A pair obtained on 16. iii. are in full breeding-plumage.

M. f. thunbergi Billberg. (= *borealis* and *viridis.*)

Never observed on spring passage. A few passed through Quetta during the latter half of August, when I obtained an adult female and an immature bird. Marshall (B. N. H. S. xiv. p. 601) records this form from Quetta in April.

Motacilla melanocephala.

M. m. melanogriseus (Homeyer).

M. feldeggi Oates, Fauna Brit. India.

I prefer to keep the Black-headed Wagtails separate from the *Motacilla flava* group.

This race passes through Quetta on spring passage from 15. iii. to 5. v., when it is fairly common, not only near water but on the arid plains, but never in flocks.

Two cocks obtained on 22. iii. and 5. v. They were not observed on autumn passage.

Motacilla citreola.

M. c. citreola Pall.

These birds were only observed on spring passage, when they commence arriving about the middle of March. By early April they were in thousands, all in breeding-plumage, on the Lora River and elsewhere where shallow water exists, forming a most remarkable sight, which I have only seen equalled by the myriads of various forms of *M. flava* which congregate at Entebbe on the Victoria Nyanza previous to their northward passage. By 26. iv. all had left for the north, and none were seen on the return passage.

M. c. citreoloides (Gould).

This race does not arrive in Quetta on spring passage till early April, when it mixes with the previous race, but is never so common, there being about one *citreoloides* to twenty *citreola*, from which it can be told at a glance by its black mantle and larger size. It remains a few days after *citreola* has departed and, except for the few breeding birds, have all gone by 1. v.

I located three pairs breeding, but only succeeded in finding two nests, both containing young—one at Khushdil on 20. vi., and the other at Bostan on 18. vi. In both cases the young were ready to leave the nest.

Motacilla cinerea.

M. c. melanope Pall.

A widely distributed but very local summer visitor to the mountain streams. Possibly a few remain for the winter. Birds arrive in full breeding-dress about 18. iii., and commence building about 3. v. A nest found at Urak on 2. vi. contained four eggs, and was placed under a large stone among boulders. It was a large structure of fine grass and fibres. A similar nest found at Khawas on 10. vi. contained five half-fledged young. These birds breed between 7000 and 9500 feet.

Motacilla alba.

M. a. dukhunensis Sykes.

A common winter visitor to the Quetta Plains, arriving during the last days of September and leaving during the first few days of April. Also a common bird of passage in October and March.

M. a. personata Gould.

Obtained on 1. iii. and 17. v. Only a few were seen, mostly in spring and autumn, but it is possible that an occasional pair breed, as I saw them at Khushdil throughout May, and near Baliki on 2. vi. None observed in midwinter. Watson (B. N. H. S. xv. p. 145) reports them common at Chaman in winter.

Cinnyris asiatica (Lath.).

I am unable to say whether the form which occasionally straggles to Quetta is the typical form or *brevirostris*, as I never obtained a specimen. Examples have, however, been frequently observed, mostly in the early autumn. It would be a matter of great interest to decide the question, as Quetta should be about the junction of the two races.

Certhia himalayana.

C. h. himalayana Vig.

Four examples were obtained from 24. vii. to 30. vii. between 8500 and 9000 feet at Ziarat, where these birds are not uncommon in the juniper forest. As is the custom of Tree-Creepers, they consort with Tits and Warblers.

My birds agree with Himalayan specimens.

Tichodroma muraria (L.).

A not uncommon winter visitor to the hills and plains of the Quetta District, though not observed before 30. x. or after 31. iii. A male obtained on the latter date was in full breeding-plumage.

Sitta neumayer.

S. n. tephronota Sharpe.

A fairly common resident in suitable country, descending to the plains in winter and breeding between the 8500 and 9000 feet levels in May. A nest with two eggs was found on 10. v. It was in the cleft of a rock, and was a huge mass of grass and feathers, with hair and cotton lining. The eggs were white, with small rusty spots, mostly at the base. I also noted two birds building in a cleft on 3. v. making a mud foundation and entrance to their nest, and on 31. v. I found five fully-fledged young being fed by their parents. I never once saw this species on a tree, nor was it observed in the Ziarat juniper forest.

Two specimens obtained agree with the series in Tring.

Parus major.

P. m. intermedius Sarud. (= *atriceps* Oates, F. B. I.)

Resident in the Quetta District, descending to the plains in winter and breeding in the hills above 8500 feet. A nest found on Zarghun on 3. v. was in a hole in a juniper stump some five feet from the ground, and contained four white eggs with a few reddish-brown spots at the larger end. I did not disturb it. Another nest found on Takatu on 23. v. was in a hole in an old mulberry tree, and beyond hearing the hissing of the old bird inside I experienced nothing.

The one specimen I brought home appears to belong to this form, and agrees with specimens from Turkestan.

Parus rufonuchalis.

P. r. rufonuchalis Blyth.

A fairly common resident in the Ziarat juniper forest, seldom descending to the plains. I never observed it nesting, but Captain Hawley states that it commences at Ziarat in early April.

One obtained on 1. viii. agrees with Cashmir specimens.

Ægithalos erythrocephalus (Vig.).

I saw a large party of these Tits at Ziarat throughout July. They seldom left the three or four trees which seemed to be their home, and were so tame that I caught one in a butterfly-net. Marshall observed a pair at Ziarat in May, and I presume that they are resident in very small numbers.

One example obtained agrees with Himalayan specimens.

Lanius excubitor.

L. e. pallidirostris Cass. (= *assimilis* Brehm.)

A summer visitor to the foot-hills, and common locally, arriving in early March and leaving in early November. A nest found on 11. vi. at Spereragha contained four young about a week old, the nest being in a wild almond bush about eight feet from the ground and of the usual type. I found it especially common round Kach and Azim from June to August.

Seven obtained from 7. iii. to 2. viii.

L. e. aucheri Bp. (= *fallax* Heuglin.)

I obtained males of this race on 27. ix. and 2. x. There is a male in the Quetta Museum from Hirok on 28. vi., and I shot a pair at Mangi on 2. viii. which I was unable to preserve. The specimens I brought home agree well with the series at Tring.

Both *Lanius minor* and *L. excubitor lahtora* have been reported at Quetta. I met with neither bird.

Lanius vittatus Valenc.

A fairly common summer visitor, arriving in the early days of April and leaving in late August. Eggs were taken on the first three days of May, only one clutch being full. Half-fledged young were found on 27. v. The nests were large for a Shrike, and composed of twigs, grass, and a few leaves, with a soft lining of rubbish.

Lanius cristatus.

L. c. phœnicuroides (Schalow).

A common summer visitor to the hills, arriving in early March and leaving at the end of August. Nests with two and four eggs were found on 26. iv. and 10. v. respectively between 6500 and 8000 feet, but breeding birds were observed up to 9000 feet in June. The nests were slovenly structures in low thorn bushes. Both clutches were greenish white with a ring of red-brown and purple spots at the larger end.

L. c. isabellinus Hemp. & Ehr.

A fairly common bird of passage on both migrations, more so in the spring than in autumn, being commonest in the first half of March. The various reports of this race breeding in the Quetta hills have undoubtedly arisen from a confusion between *isabellinus* and *phœnicuroides*.

Five obtained between 3. iii. and 24. iii.

Lanius schach.

L. s. erythronotus (Vig.).

A common summer visitor to the Quetta Plains, nesting freely in gardens and orchards. It commences to arrive about 1. iv., and had disappeared by 31. viii. The adults were the first to leave, and were followed a few days later by the young, departures being made during darkness.

Eleven nests with eggs were found between 18. iv. and 19. v., the full clutches of four and five only after the 1st of May. Eggs are laid at an interval of forty-eight hours. All the nests were loose, clumsy, cup-shaped structures of grass, leaves, and twigs, with bits of rag, string or leaves inserted. Four were in peach trees, one in a plum tree, three in apricot trees, three in rose hedges, and one in a vine against a house. Eggs greenish or creamy white, with red-brown blotches and spots, more numerous at the base. Average of ten eggs: ·93 by ·71 inch.

The first young in nest were found on 26. v., and others in early June.

These large Shrikes have insatiable appetites, and the family habit of slaughtering in excess of requirements is carried to an extreme. One "larder" contained a nestling Sparrow, the head of another small bird, eight beetles, and a piece of rag. Another contained three dragon-flies, four beetles, a butterfly, and two grasshoppers.

Bombycilla garrulus.

B. g. centralasiæ Polj. (= *Ampelis garrulus* auct.)

One of a pair was shot on 11. xi. No others were seen.

I have compared this bird with the Waxwings in the British Museum, and it is not difficult to pick out the Asiatic birds by the paler and less vinaceous colour of the upper parts. It must be this form which occurred on the North-west Frontier of India in November, February, and March (Ibis, January 1909), at Samarkhand in February (Ibis, July 1910), at Pekin in winter (Ibis, January 1903), in northern Siberia south to Vladivostock, and in winter in central and southern China (*cf.* Oberholser, Auk, July 1917).

Pycnonotus leucotis.

P. l. leucotis (Gould).

One was obtained at Quetta on 14. x. Others in the Quetta Museum were obtained there in August, November, and December, whilst I observed single birds in May, July, and August. Marshall reports them at Quetta in March and April. I suspect that they are rare local residents, for we can scarcely accuse the homely Bulbul of being a straggler, though it may be a question of gradual expansion. The species occurs in east Persia and a race (*Mesopotamia*, Ticehurst) at the head of the Persian Gulf.

Muscicapa striata.

M. s. neumanni Poche.

A summer visitor to the wooded hills of northern Baluchistan in considerable numbers, breeding freely at and near Ziarat. I did not note the time of arrival, but the birds returned from these haunts about early September. They do not build below 7500 feet. Two nests found containing five and four eggs respectively on 27. v. and 28. v.

Muscicapa parva.

M. p. parva Bechst.

A common bird of passage throughout March and until about the middle of April. The autumn passage lasts from the middle of September to about 13. xi.

I am unable to separate the two specimens I brought home from the typical form.

Tchitrea paradisi (L.).

A straggler which occasionally breeds in the Quetta District. In the spring of both 1913 and 1914 I saw pairs of these birds which looked like nesting, but their preference for gardens was their undoing, and in each case they moved their quarters to less inquisitive climes. Zugmeyer obtained a male at Pishin in September 1911 (Laubmann on "Birds collected by Zugmeyer in Baluchistan").

Phylloscopus collybita.

P. c. tristis Blyth.

A common bird of passage on both migrations, from the last week of September and throughout October, and again in spring from 27. ii. to 3. iv. An exceptionally early traveller was obtained on 28. vii.

Phylloscopus neglectus.

P. n. neglectus Hume.

A common summer visitor to the Ziarat juniper forests where, though I never found the nest, there can be no question about its breeding, for it was more or less plentiful throughout June and July. I did not note the time of arrival, but the birds returned from their breeding haunts from about 13. ix. to 30. ix. One obtained on 18. i. was the only example met with in winter.

Of eight specimens obtained, the wings of males vary from 47 to 51 mm. The second primary equals the ninth in three instances, the tenth in two, and the eleventh in two. The first primary extended from 4 to 5·5 mm. beyond the wing-coverts.

Phylloscopus nitidus.

P. n. nitidus Blyth.

Only observed on autumn passage from 11. x. to 8. xi., when the birds were far from common and usually in small parties of about fifteen among the willow trees near water.

Phylloscopus indicus (Jerd.).

This species was found commonly at certain sheltered spots in the juniper forest at Ziarat throughout June and July, usually near water in ravines, where they had no doubt bred, as quite young birds were seen in early June. They were not noted passing either to or from their breeding haunts, but there is a specimen in the Quetta Museum from Nushki obtained during May, which may show they are late spring migrants.

Six obtained, all at 8000 feet near Ziarat. Wing 61–63 mm. Second primary equals the tenth or eleventh.

Lusciniola melanopogon.

L. m. mimica Mad.

A fairly common bird of passage in spring and autumn, but must be carefully looked for on account of its skulking ways and the very limited area of country suitable for its habits, which are purely aquatic. The bulk appear to move north from the end of February and during the first half of March, and to move south from the last days of August and throughout September. None were observed in winter. A few birds are summer visitors. I only located three pairs breeding, and I found all their nests with eggs—two on the Lora River near Baleli on 1. vi. and 2. vi. with three eggs each, and one at Kuchlak on 14. v. with four eggs. The nests were in dense tangled sedge standing in about a foot of water, and were deep cup-shaped structures of dead reed-stalks, ornamented with grass seed and the flowers of reeds, while in one instance there was a little camel-hair lining. The eggs were very similar to those of the Sedge-Warbler, densely covered with dark- and greenish-brown spots which in two clutches had distinct zones of hair-lines round the larger end of the egg.

Four specimens obtained. Wing of males 62 mm.

Acrocephalus stentoreus.

A. s. brunnescens (Jerd.).

A few pass through in spring and autumn, being most noticeable from the end of August to the middle of September, when they are very noisy and can be found in gardens far from water. They are also a summer visitor in small numbers, and most large reed-beds have a breeding pair in summer, where their harsh rasping love-song invariably betrays their presence.

Nests were found on 19. v., 1. vi., and 1. vi. with two, four, and three eggs respectively. They were deep cups of reeds, and all the eggs were particularly handsome, having a greyish-white ground-colour, boldly blotched with reddish, purplish, and dark brown spots. A nest was also found at Khushdil on 19. vi. containing three half-fledged young.

Acrocephalus arundinaceus.

A. a. zarudnyi Hart.

A female was obtained by Zugmeyer at Kelat on 4. x. I did not meet with this bird.

Acrocephalus dumetorum Blyth.

I shot a female on 4. iii. Not otherwise observed.

Acrocephalus agricolus.

A. a. agricolus Jerd.

This noisy little bird was only seen on autumn passage. It commenced to arrive on 22. viii., and was last seen on 1. xi., the bulk moving during the last week of August and the first half of September. I had quite expected to find it breeding in haunts which well suited its habits, but not one was seen in either spring or summer.

Hippolais languida (Hemp. & Ehr.).

A scarce summer visitor, only found nesting at one place, on the eastern slopes of Takatu between 7500 and 8000 feet. It appears to arrive in early April, the first being obtained on 6. iv. A nest found on 31. v. was in a small bush, 18 inches from the ground, and was made of coarse grass, fibre, and hair with a wool and cotton lining. Eggs pinkish white with a few black and deep purple spots evenly distributed. A second nest found on 11. vi. was one foot from the ground, both it and its eggs being similar to the above. Each nest contained three eggs, and in each case the bird was sitting. Eggs averaged ·75 by ·6 inch.

Hippolais pallida.

H. p. elæica Lind.

Baluchistan birds belong to this pale eastern race. A female was obtained at Quetta on 31. viii. There are also two females in the Quetta Museum obtained locally on 12. vi. and 31. viii.

Hippolais rama Sykes.

A common summer visitor, but very local as a breeding species, becoming more widely distributed in late July and August. It arrives on its breeding ground during the first few days of April and leaves towards the end of August.

On 19. vi. I found seven nests at Khushdil, one of which contained four newly-hatched young and the others one, three, or four eggs. The nests were from two to three feet from the ground in thick tamarisk bushes near water, were made of coarse grasses and fibres, thinly lined with camel-hair, and were deep cups 1·9 inches deep and 1·8 inches inside diameter from lip to lip.

The eggs were dull pinky white, with a cluster of grey blotches, dark brown and black streaks at the base. The density of the basal markings differed considerably in each clutch. The eggs of one clutch measured ·64 by ·51 inch, and of another ·65 by ·51 inch.

Marshall found this species breeding in Quetta in the middle of May, and there is a clutch in the Museum taken from a garden there in early July.

The wings of eight specimens obtained vary from 60 to 64 mm. The second primary was equal to the seventh in five cases, and to the eighth in three cases.

Hippolais caligata (Licht.).

Obtained on 2. x. and 4. x., but not otherwise noted.

Sylvia hortensis.

S. h. crassirostris Cretzschmar. (= *S. jerdoni* Oates, F. B. I.)

A common summer visitor to the hills, arriving in late April and commencing to move south about the end of August. Nests with five and four eggs were found on 31. v. at 8500 and 9000 feet on Takatu, and with five, four, and five young on 31. v., 7. vi., and 10. vi. between 7500 and 10,000 feet. They were usually in a wild briar or almond bush about three feet from the ground, and were made of coarse grass with a fine grass lining, being 1·6 inches deep inside and 2·4 inches inside diameter from lip to lip. In one case the eggs were white with light brown, bluish brown, and dark brown spots, larger at the base, and in another case the eggs were white with a ring of big bluish black and dark brown spots at the larger end of the egg.

Marshall (B. N. H. S. October 1903) describes a nest placed ten feet from the ground at the end of a drooping branch of a fair-sized tree, composed outside of thin sticks and lined with fibres, the whole being rather a flimsy construction. The eggs were white with spots of two shades of green.

The song of this bird is extremely beautiful and is delivered from the inside and not from the top of a bush. Both parents are adepts at feigning injury when the nest is disturbed, when they will fly and flutter in their distraction almost under an intruder's feet.

Sylvia communis.

S. c. icterops Menetr.

On 24. vii. when at an altitude of 7500 feet near Ziarat, I noticed a family of what I took to be Whitethroats being fed by their parents. They remained for a fortnight near my tent and I had ample opportunity of observing them. For obvious reasons I refrained from obtaining a specimen for identification. During the next year, on 23. v. on the eastern slopes of Takatu, at 7000 feet, I found a nest with two eggs of this race, and shot the hen bird as she left it.

The nest was in a thorn bush, and was made of coarse grass with a lining of fine grass and hair. Eggs greenish white, spotted and speckled with greenish grey and greenish brown. They measured ·71 by ·54 inch.

The parent is undoubtedly referable to this form, being much greyer on the flanks than typical specimens and having a wing-measurement of 80 mm.

Sylvia curruca.

S. c. affinis Blyth.

A female in the Quetta Museum was obtained at Ziarat on 14. viii. I did not meet with this race.

S. c. minula Hume. (=*minuscula* Oates, F. B. I.)

Mainly a bird of passage on both migrations, in spring from early March to the end of April, sometimes seen in small parties, and returning again in autumn from October till the third week of November. I did, however, obtain two examples at Ziarat on 21. vii. and 24. vii., and it seems more than likely that they nest there, as I saw several birds of the year, and those that I observed showed no signs of being on passage, but were always to be found in exactly the same place day after day.

Sylvia althæa Hume.

A fairly common summer visitor to the juniper forests of Ziarat, where, though I never found a nest, the birds were in plenty from June to the end of August, and several family parties were seen. Six were obtained between 24. vii. and 30. vii., all in full moult. Their autumn departure was not recorded, neither was their spring arrival, except for one male I obtained at Quetta on 1. iv. They doubtless pass direct from their breeding haunts to the Indian Plains and *vice versa*, without tarrying on their way, as is the custom with most Warblers.

Sylvia nana.

S. n. nana (Hemp. & Ehr.).

I never met with this bird, but Watson obtained a specimen at Sanzal in northern Baluchistan.

Agrobates galactotes.

A. g. familiaris (Menetr.).

A scarce bird of passage on both migrations, and may possibly breed at Nushki. I obtained single birds on 1. ii. and 8. viii.; a specimen in the Quetta Museum was obtained at Nushki in May, while Watson procured birds at Chaman in August and at Sanzal in September.

Scotocerca inquieta.

S. i. striata (Brooks).

A common resident up to 9000 feet in summer and to the Quetta Plains in winter. Four nests found between 8000 and 9000 feet from 20. v. to 7. vi., containing five, five, six, and four eggs respectively. No nest actually rested on the ground, though they almost touched it. They were cunningly placed in thorns, in one case with a huge wild rhubarb leaf bushes, sheltering the nest from the sun.

Suya crinigera Hodgs.

The only specimen observed was obtained on Zarghun at 9500 feet on 3. v.

Prinia gracilis.

P. g. lepida Blyth.

One was obtained at Quetta on 2. viii., while another in the Museum there was shot at Shahrig on 17. xii. It can only be classed as a rare straggler to northern Baluchistan.

Ianthocincla lineatum (Vig.) subsp.?

I obtained one adult and four immature birds at Ziarat between 24. vii. and 26. vii. They were not uncommon in small family parties in the thick bush at the bottom of wooded ravines.

Sarudny (Ornith. Monatsb. xviii. Dec. 1910, p. 188) describes a new race of *Ianthocincla lineatum* from Bokhara. He explains that he has been unable to compare his birds with any Himalayan specimens and is guided solely by Hartert's 'Vögel der pal. Fauna.' His bird, which he names *bilkevitchi,* is too dull and too grey for *Ianth. l. lineatum.* In some cases the under parts resemble *grisescentior*, in others *gilgit*, whilst in others they are much brighter than in either form. *Bilkevitchi* differs from these (*sic*) forms in the larger amount of grey on the upper parts and, mainly, in the dull olive-red colour of the shoulder and parts of the back, which are marked with white shaft-stripes. Wing 80 to 98 mm.

The wing of the type of "*gilgit*" measures 82 mm., and one in my own collection has a similar wing. Five "*grisescentior*" at Tring vary from 79 to 81 mm. *Ianth. l. lineatum* varies from 74 to 77 mm.

On comparing my birds with the series of *I. lineatum lineatum*, *grisescentior*, and *gilgit* both at Tring and the British Museum, it is clear that they belong to none of these three races, being much greyer and more closely resembling Sarudny's description of *bilkevitchi*.

Three birds from near Quetta have wings of from 80 to 84 mm.

I leave this undoubted new Indian form of *lineatum* without a name, being unable to examine the type of *bilkevitchi*.

Birds from Kohat (N.W. India) belong to *grisescentior*.

Turdus viscivorus.

T. v. bonapartei Cab.

A local but widely distributed resident, confined to juniper forest in summer and descending lower in winter, though seldom actually seen in the plains. In the neigbourhood of Ziarat in 1913 it was particularly common, and from thirty to forty of these huge Thrushes could be seen in a morning.

I found a nest on Zarghun at 9500 feet on 4. iv. which was 14 feet from the ground in the fork of a large juniper, and contained three eggs. Another found by Marshall at 8000 feet on 1. v. was 10 feet from the ground and contained four eggs.

The wing of a male I shot measured 172 mm. and that of a female 163 mm. Both birds are much paler on the upper parts than European specimens, but Hartert (Vög. pal. Fauna) states that this is not constant.

Turdus ruficollis.

T. r. atrogularis Temm.

Common winter visitors to the Quetta Plains and more sheltered valleys. They arrive in small parties during the first or second week of November and remain till the first week of April.

Monticola saxatilis (L.).

A scarce summer visitor, only one breeding pair located. The nest was at 10,000 feet on Takatu, and on 10. v. contained two eggs. I was, however, unable to handle them owing to the inaccessible nature of the cleft in which the nest was placed, but I was able to examine them from above and about ten feet away. The spotless blue of the eggs and the obvious distress of the very conspicuous and noisy parents, left no doubt in my mind as to their identification. On 19. v. I again visited the nest, which now contained five eggs, but the cock bird gave his mate the alarm and I was unable actually to see the hen bird on the nest.

A bird of passage in small numbers during April and early May, and again in October. Occasional in winter.

It is probable these birds breed on most of the higher and wilder hills, as I saw a family party of young and parents near Ziarat on 19. vii. at 8000 feet, from which I obtained a young cock.

Monticola solitarius.

M. s. pandoo (Sykes). (=*Petrophila cyanus* Oates, F. B. I.)

A regular summer visitor to the higher hills, passing through Quetta from late March together with a number of birds which mean to travel further. They begin to move south from the end of August. None observed in winter.

Two nests were found with eggs. One at 9500 feet on Zarghun with three eggs on 3. v., and another at 8500 feet on Takatu with four eggs on 23. v. In each case the eggs had small red freckles, mostly at the larger end. On 28. vii. I found three young in the nest at 7000 feet near Ziarat.

I have assigned my specimens to this form purely on measurement, three males having wings of 115, 112, 112 mm.

In colour they are identical with European specimens, which separates them at once from *M. s. transcaspicus*, which is apparently also obtained at Quetta on passage, though I never secured one.

Myiophoneus temminckii.

M. t. temminckii Vig.

Resident above 7000 feet in nearly every secluded gorge. I found it a very shy bird but with an exquisite song which, when heard resounding through some mossy gorge to the sound of falling water, is a joy never to be forgotten.

I never found a nest, but saw full-grown young being fed on 20. vii.

The wings of two males measured 184 mm. and of one female 177 mm.

Œnanthe œnanthe.

Œ. œ. œnanthe (L.). (= *Saxicola œnanthe* Oates, F. B. I.)

An adult male was obtained at Quetta on 17. iii. and an adult female on 18. x. Not otherwise observed.

Œnanthe deserti.

Œ. d. albifrons (Brandt). (= *Sax. deserti* Oates F. B. I.)

A fairly common bird of passage, commencing the autumn passage in late October, while a few remain till the first days of December. It reappears in breeding-plumage from 28. ii., the latest being observed on 29. iv. None were seen in summer, though Marshall reports a nest with young at Quetta on 24. v. Two "*montana*" varieties were obtained on 28. ii. and 4. iii. The wings of males varied from 91 to 96 mm.

There are specimens in the Quetta Museum from the town dated Jan. and Feb.

Œnanthe finschii.

Œ. f. barnesi (Oates, F. B. I. 1890).

A fairly common winter visitor to the Quetta Plains from early October (first observed on 9. x.) but disappearing in early December. Not noted at any other time of the year. Though I saw a great number of males I only once saw a female, which I obtained on 18. x. The wings of six males varied from 92 to 95 mm.

Œnanthe isabellina (Cretzs.).

A common winter visitor and bird of passage in spring and autumn, arriving on spring passage in the middle of March and passing through in autumn from late August to late October. A fair number are also summer visitors, when they breed not only in the plains but up to 8000 feet. In 1913 I never found a nest and the birds were scarce, but in 1914 they were common and I found nests with eggs from 24. iv. to 2. vi., and two with young on 19. v. and 24. v. Marshall, however, found two nests with young about 20. iv.

Owing to the very confined area in which these birds live during their summer or winter stay in a neighbourhood—often a matter of a few hundred yards, it was not difficult, by plotting out the various pairs, to discover movement. I found the same method most useful with Chats in their winter quarters at Nairobi in East Africa, where a pair of Pleschanka's Chat remained in almost the same acre for over four months, while a single Finsch's Chat remained within less than an acre in the middle of G. H. Q. Camp at Rafa in southern Palestine from 20. x. to the day I left in January.

Œnanthe xanthoprymna.

Œ. x. chrysopygia (de Filippi).

A rare autumn and winter visitor. I obtained the only two I saw on 16. xi. and 18. viii. in different years. There are also specimens in the Quetta Museum from 11,000 feet and 8000 feet, both shot in November. Watson obtained one at Chaman in September.

The wing of the male I obtained measures 90 mm. and that of the female 92 mm.

Œnanthe picata (Blyth).

An abundant summer visitor to the Quetta District, ascending to 11,000 feet but being usually found in largest numbers between 6000 and 8000 feet. They commence to arrive in the first few days of March and leave again in early September. One killed at Mach on 13. i. was very exceptional.

I found nine nests with eggs, the first with two on 2. v. and the last with five on 30. vi. Young were found from 20. v. to 12. vi. The nests were in clefts of the natural rock in six cases, in a heap of stones once, in stone or mud walls three times, and in a wood stack once. They were always far in and well hidden, being large grass structures with a good many feathers, and occasionally a slight wool or hair lining.

The wings of three males vary from 88 to 91 mm.

Œnanthe opistholeuca (Strick.).

A rare bird of passage on both migrations. In spring I saw a pair on 24. ii., and there is a male in the Quetta Museum obtained locally on 18. iii. In autumn I shot a female at Quetta on 21. x.

Saxicola torquata

S. t. indica (Blyth). (*Pratinc. maura* Oates, F. B. I.)

Usually an abundant summer visitor to the hills over about 7000 feet, but local. Particularly abundant at Khawas, Ziarat, and Spereragha. The majority of these breeding birds leave the Quetta District altogether in winter, but a few remain and can be found in the plains in sheltered nooks. The movement to the breeding grounds in the hills takes place in April.

I found one nest of this Stonechat at Ziarat on 29. v., containing four eggs, and I saw many fully-fledged young at the same place throughout July.

I do not believe that the true *maura* occurs in India, but winters in southern Arabia, Abyssinia, Somaliland, the Sudan, etc., breeding in the Caucasus and S.W. Persia (Witherby, Ibis, October 1903). At least a quarter of the tail is white at the base and the upper tail-coverts are without streaks. In *indica,* which breeds from Baluchistan through Cashmir and Turkestan to the Petchora, the tail-coverts are very similar to those of *maura*, but there is less white at the base of the tail.

Saxicola caprata.

S. c. rossorum Hart.

A common summer visitor to the Quetta plains and hills, breeding from 5000 to 10,000 feet. First spring arrival was noted on 4. iii., while the latest date in autumn on which one was seen was 11. ix., but Marshall found that this Chat left in October. It is exceptional to find it very far from water, and the majority breed on the plains.

Nests with eggs were found from 26. iv. to 2. vi., and young able to fly were seen on 19. vi. One nest found on Takatu at 10,000 feet on 10. v. contained a Cuckoo's (*telephonus*) egg.

The nests were always in slight holes in a bank, under a large stone or clod of earth.

The white on the breast of males from Quetta extends from the end of the breast-bone to the vent.

Chimarrornis leucocephala (Vig.).

This particularly handsome Redstart was obtained on 2. iii., and another was seen at close quarters near Baleli on 14. iv. It was not observed at any other time. In each case the bird was on rocks by running water.

Phœnicurus ochruros.

P. o. phœnicuroides (Moore). (= *Ruticilla rufiventris* Oates, F. B. I.)

An abundant summer visitor to the hills, breeding up to 11,000 feet on Murdar and commonly at Ziarat between 7000 and 9000 feet. I did not note the time of arrival or departure. A nest with five eggs was found on Murdar at 10,500 feet on 7. vi. It was in the broken bark of a dead fallen juniper, and consisted of a mass of grass, feathers, fibre, and juniper bark, lined with fine bits of bark and a few feathers. The eggs were pure Hedge-Sparrow blue. Another similar nest was found on the same day with three eggs. Young and fully-fledged being fed were found at Ziarat at 7000 feet on 21. vii., whilst other birds of the year had already separated from their parents.

This Redstart sings throughout June and July, and is rarely found in summer far from juniper trees.

Marshall found a nest with four eggs on 13. v. at 9000 feet on a ledge of rock in a cave.

Phœnicurus erythronota (Eversm.).

A common winter visitor to the Quetta District from early November to the middle of March, a few old cocks assuming full breeding-plumage before departure. It was noted that some females remained a few days after all the cocks had left, the last cock being seen on 13. iii. and the last hen on 18. iii.

Luscinia megarhynchos.

L. m. golzii (Cab.). (=*Daulias golzi* Oates, F. B. I.)

A male was obtained 2. ii. Another in the Quetta Museum was shot locally on 30. iv.

Luscinia svecica.

L. s. pallidogularis (Sar.).

Four males were obtained from 2. xi. to 4. iii.

L. s. svecica (L.).

A male was obtained on 26. iii.

Bluethroats are birds of passage on both migrations, in autumn in October and November, and in spring from about 7. iii. to 28. iv. It is, of course, impossible to discriminate the two races without obtaining specimens. These specimens were compared with the series at Tring, but the differences between the various races of *svecica* are so trifling as to make determination open to a certain amount of doubt, though I think, on the whole, that these two races are represented among Quetta specimens.

Prunella atrogularis (Brandt).

A regular, but not very common, winter visitor, arriving only after a cold spell, usually in late November and remaining at least till the first few days of March. Three specimens were obtained on 22. xi., 4. xii., and 2. iii.

Chelidon rustica.

C. r. rustica (L.).

A common summer visitor, breeding freely between 5000 and 7000 feet, both in houses and in culverts. The first spring arrival was noted on 28. ii., but the bird was not really plentiful till 6. iii. Eggs were found from 23. iii. to 2. vi., and young in the nest from 19. iv. to 1. vii. About 8. viii. they commenced to flock in mixed parties of old and young, and departure took place about the third week of August. No Swallows were seen after 30. viii.

I observed no trace of any considerable passage of Swallows through Quetta on either migration.

Chelidon daurica.

C. d. rufula (Temm.).

An evenly distributed but scarce summer visitor, breeding from 5000 to 11,000 feet. First arrivals noted 21. iii., departure and autumn passage noted in September and October. I never saw these birds otherwise than in pairs or in family parties till September and October, when parties of eleven or twelve could occasionally be seen on passage.

Nest-building was taking place at 8500 feet on Zarghun on 3. v., and a completed nest with parents entering at frequent intervals was seen on Takatu at 10,000 feet on 10. v. On 7. vi. I found two nests with eggs on Murdar at 10,500 and 11,000 feet, and at Khushdil at 5000 feet there were young in a nest on 19. vi.

There is no question regarding the race to which these birds belong, though Marshall records *Chelidon d. nipalensis* from Quetta, which is obviously an error. I obtained five birds, three males and two females. The wings of the males measure 112, 113, and 120 mm., whilst the wings of the females measure 108 and 114 mm. The red neck-band is continuous on the back of the neck. The lower back and rump are chestnut shading into pale cream on the upper tail-coverts. The breast shows indistinct shaft-stripes. The fact that breeding birds from the same district vary from 112 to 120 mm. in the length of their wings, should dispose of the *Chelidon rufula scullii* (Seeb.), which can only be rather small *Chelidon daurica rufula.*

Hirundo urbica L.

Marshall (B. N. H. S. xiv. p 601) obtained a House-Martin near Quetta in May. This appears to be the only record, and as I have not been able to examine the specimen, its subspecific value cannot be determined.

Riparia riparia.

R. r. riparia (L.).

Obtained on 1. viii. and 4. viii., two single cock birds.

R. r. diluta (Sharpe & Wyatt).

An adult male was obtained on 11. vi. and an immature female on 24. vi., the former being a single bird and the latter in a small party of ten. The wings of these two birds each measure 112 mm.

Sand-Martins were observed breeding near Quetta in April by Mr. J. W. N. Cumming, which were probably *diluta*, the typical race being only a passage migrant. I never saw any signs of nesting colonies along the many miles of earth-bank and cliff which I visited in northern Baluchistan.

Riparia rupestris (Scop.).

A fairly common summer visitor to the hills, where a few are always to be found nesting in suitable localities. Their time of arrival was not noted. I did not examine any nest, but birds were incubating on 3. v. and 19. vii., and young were in the nest on 7. vi. and 24. vii.

Two obtained, at 10,000 feet on 21. iii. and at 7000 feet on 28. vii. None were observed after 20. viii.

Apus melba.

A. m. melba (L.).

A fairly common but local summer visitor to all the Quetta hills which I visited, occurring from the highest tops to the lowest valleys. I never found the nesting sites. Marshall states it arrives from the end of April. I noted large parties evidently migrating over Quetta from 23. viii. to 30. viii. A male I shot on 1. viii. has a wing of 209 mm.

Apus apus.

A. a. pekinensis (Swinh.).

A common summer visitor to the hills. Times of arrival and departure not noted, the first seen being on 2. v. and none being observed for certain after the first week of July. It breeds exclusively in cliffs and caves up to 11,000 feet, apparently laying towards the end of May, and young were heard in a nest on 7. vi. A male obtained on 17. v. is undoubtedly this form.

Apus affinis (Gray).

A. a. galilegensis (Antinori).

A summer visitor to the Quetta hills, first noted on 22. iv., the latest seen being on 8. viii. Marshall found eggs on 17. v., and I found young in the nest on 7. vi. on Murdar at 8500 feet. One obtained on 20. v. agrees with birds from N. W. Africa and Palestine.

Caprimulgus europæus.

C. e. unwini Hume.

An uncommon summer visitor, also a bird of passage noted in spring and autumn. It breeds between 5000 and 9500 feet, three nests with two eggs each being found on 6. v., 10. v., and 28. v. I visited the latter on 3. vi., but the eggs had hatched about the previous day.

No dates of arrival or departure were determined, but passage was most noticeable during April, and from 12. viii. to 1. ix.

Merops apiaster L.

A common summer visitor to the Quetta Plains, the earliest arrival being noted on 4. iv., while it was common and had commenced excavating holes by 15. iv. First eggs found on 9. v., and young commenced to appear on the wing on 19. vi. All had left by 1. ix. When the young can fly the breeding colony often disappears for a week or so at a time, returning at intervals to the nesting-site, food-supply being probably the cause of such local movements. Not only bees, but wasps and hornets, with which Quetta abounds, are greedily devoured.

I noted a passage of non-breeding birds at Ziarat at 8000 feet on 24. vii., and this was the only occasion on which I saw them in the hills.

Merops persicus.

M. p. persicus Pall.

A local summer visitor. In 1914 it nested at Sheikh Wasil in June, and at Khushdil three pairs had eggs on 2. vi. Two were obtained at Khushdil on 17. v.

Merops orientalis.

M. o. beludschicus Neum. (= *M. viridis* auct.)

There are two examples in the Quetta Museum, both killed in January.

Upupa epops.

U. e. epops L.

Widely distributed in northern Baluchistan from March to October, breeding at 5000 feet in the plains and up to 9000 feet in the hills. Nests with three, one, and five eggs were found on 14. v., 29. v., and 11. vi. Young were found in the nest on 17. vi. At Ziarat at 9000 feet I saw several full-grown young throughout July.

In winter an occasional bird can be seen, and in February 1914 I noticed one hopping about in snow. I saw another at the top of the Khojak Pass on 12. xi.

Coracias garrulus.

C. g. semenowi Loudon & Tschusi.

This eastern race of the Roller occurs on passage only, and is never common, though of regular occurrence. In spring it was noted on 7. iv. and 11. iv., and in autumn on 28. vii., while a fair number from 4. viii. to 30. viii.

Two were obtained in August.

Alcedo atthis. (= *Alcedo ispida.*)

A. a. pallasii Reichenbach.

From late September to early May it can be found wherever there is water. There are specimens in the Quetta Museum obtained in February, April, May, and November.

An occasional pair may breed, but I have no evidence, except that I saw a bird in the hills on 17. vii.

Halcyon smyrnensis.

H. s. smyrnensis L.

A bird in the Quetta Museum was obtained there on 2. viii. and was doubtless a straggler from Sibi, where it is resident. This bird is of the typical race and not *fusca.*

Picus squamatus.

P. s. flavirostris (Menzbier). (= *Gecinus gorii* Harg.)

A local resident, observed at Ziarat between 7000 and 8000 feet in July and August, at Sheikh Wasil in October, and at Torkhan in September. There are specimens in the Quetta Museum obtained locally in September and December. I obtained birds at Ziarat on 23. vii. and 1. viii.

Dryobates scindianus (Horsf. & Moore).

Resident in small numbers on the Kwaja Amran range of hills between Chaman and the Khojak, where it is usually seen on pistachio trees. It has been occasionally seen in the gardens of Quetta, and I saw another at Pishin.

Jynx torquilla.

J. t. torquilla L.

Only occurs on spring and autumn passage, apparently in the last half of April and the first few days of May, and again in the middle of September, but never commonly.

Three birds I obtained cannot be separated from typical European specimens—in fact, I am not yet satisfied that *japonica* is a good subspecies, even after comparing the series at Tring from the mouth of the Amur River with the large series of birds from Turkestan and Europe. *Tschusii* and *mauretanica* are very distinct forms. I have not seen *sarudnyi* described from Transcaspia, but I suspect it is only the typical form of a bird which shows great individual variation in colour and size. I have recently had some very grey examples from Palestine, and at first sight these would appear to be a western Asiatic race, but birds as grey occur in western Europe as breeding individuals, whilst others from western Asia are as dark as any from England and nearly as dark as *tschusii* from Sardinia. The wings of my three Quetta birds, all females, range from 83 to 88 mm.

Cuculus canorus.

C. c. telephonus Heine.

A common summer visitor and bird of passage, but owing to its silence in autumn and the fact that it departs before the foliage is off the trees no dates of departure were recorded. First arrivals appeared on 29. iii., and birds were common by 19. iv. They leave the plains for the hills in the middle of May, ascending up to 10,000 feet.

I heard one calling before daylight at 8000 feet on 11. vi., after which the birds were silent.

An egg in the nest of *Saxicola caprata rossorum* on 10. v. was yellowish white, thickly spotted with brownish red and a few purple dots. A young bird newly hatched was found in the nest of *Anthus sordidus captus* on 9. vi.

Palæornis torquatus (Bodd.).

An irregular straggler, sometimes in small parties, during every month of the year except February and August, but there is no record of nesting in northern Baluchistan.

Bubo bubo.

B. b. turcomanus (Eversm.). (=*Bubo ignavus*, F. B. I.)

A scarce winter visitor, usually seen singly, from late August to the middle of February. I never saw or heard one in summer. There are several specimens in the Quetta Museum.

I never heard or saw any form of Scops Owl at Quetta, though they have been reported in April. *Otus brucei* has been obtained at Chaman.

Asio otus.

A. o. otus (L.).

A female in the Quetta Museum was obtained locally on 2. xii.

Asio flammeus.

A. f. flammeus Pontopp. (*Asio accipitrinus*, F. B. I.)

There are specimens in the Quetta Museum obtained locally on 21. iv. and in January.

Athene noctua.

A. n. bactriana Hutt.

One specmen was obtained near Chaman on the Afghan border on 22. x. 13. Little Owls were common there, and probably all belong to this race.

Athene brama.

A. b. tarayensis (Hodgs.).

Little Owls are abundant residents at Quetta, breeding freely in earth-cliffs, and banks, but unfortunately I only secured one specimen and failed to determine the many specimens in the Quetta Museum, where they are all labelled *Athene bactriana*. My bird agrees with examples collected by Sarudny and Härms from Persian Baluchistan, this form being much lighter coloured than *Athene b. brama* of India.

Falco peregrinus.

F. p. peregrinator Sund.

A female of this race was shot at Khushdil on 26. x. and others were seen in November, but never at any other time. It would appear, then, that though this race breeds in the northern part of the Punjab and in the North-West Provinces as far south as Kohat (Ibis, 1919, p. 370) it is only a winter visitor to northern Baluchistan.

F. p. babylonicus Scl.

An adult female was shot at Ziarat on 23. vii., and others were seen there in June, though no eyrie was found. My female had a wing of 315 mm. I never saw this race away from the hills, where it was never common, but appeared to be resident at Ziarat.

Falco cherrug.

F. c. milvipes Jerd.

I obtained an immature male of this species at Khushdil on 17. v., and in the Quetta Museum there are local specimens obtained in January and on 18. x. St. John obtained a specimen at Quetta (F. B. I. iii. p. 422).

Falco jugger Gray.

Marshall records this species as fairly common in the cold weather, and says that a pair were building a nest high up on the face of a cliff, but gives no further details. There are no specimens in the Quetta Museum, and I certainly did not find the bird at all during the two winters I was in northern Baluchistan.

Falco subbuteo.

F. s. subbuteo L.

I saw a pair of Hobbies at Ziarat on 24. vii., and there is a male in the Quetta Museum shot locally on 1. x., which belongs to the typical form.

Falco tinnunculus L.

A common resident of which I failed to get specimens. Also a plentiful bird of passage and winter visitor. The resident birds breed up to 10,000 feet and also in earth-cliffs at 5000 feet. Marshall took four fresh eggs on 14. v., and I found a nest with two eggs on 21. v.

Ægyptius monachus (L.). (= *Vultur monachus* Blanford, F. B. I.)

Not common, though, from its conspicuous size, it is frequently noted, each mountain having one or two pairs which are resident. Delmé-Radcliffe took an egg from a nest on Zarghun at 10,500 feet on 5. iv. (B. N. H. S. xxii. p. 394), and Marshall found a nest with a newly-hatched young bird on 5. v. (*ibid.* xv. p. 351). I found another chick in a nest on Zarghun at 9500 feet on 4. iv., the huge mass of sticks which composed the nest being about 18 feet from the ground in a patriarchal juniper tree.

Gyps fulvus.

G. f. fulvus (Habl.).

A fairly plentiful resident, though the birds disappear in very severe weather. Marshall found the young already out of the shell on 25. iv.

Gyps himalayensis Hume.

A local specimen is in the Quetta Museum, obtained on 10. ii. 10.

Neophron percnopterus.

N. p. percnopterus (L.).

Never observed in the middle of winter, but a few appear in early March and are seen throughout the summer. Plentiful at Ziarat in July and around Quetta till November. Birds of the year commenced to appear at the refuse dumping ground at Quetta in late July. No nests found.

Quetta birds are of the typical form.

Gypaëtus barbatus.

G. b. grandis Storr.

A common resident even in the severest weather, and breeding plentifully in the mountains. I estimated there were five pairs nesting on Murdar in 1914. One nest which I located on 2. iv. at 10,000 feet was on the ledge of a cliff, and I could see the old bird sitting, but was unable to get closer than about 50 feet and failed to move her from the nest.

This magnificent bird can be seen any day in cantonments, where it is quite tame. Though a terrible coward and unable to face the attack even of a Raven, I have seen it attempt to carry off a puppy from the verandah of a barrack-room.

The specimens in the Quetta Museum are undoubtedly referable to this race.

Aquila chrysaëtos.

A. c. daphanea Menzb.

Rare in the hills, coming to the plains in winter. Seen at Ziarat on 19. vii. and at Khushdil on 18. iii. Whilst shooting Chukar on 6. xii. a covey of those birds were attacked whilst crossing a broad valley by a Golden Eagle, which burst among them from above and carried one off on the wing, the remainder scattering in all directions and shrieking as they went. Though I have no evidence to show that this bird breeds in northern Baluchistan, there is no reason why it should not do so.

A specimen in the Quetta Museum was obtained near that place on 29. i., and belongs to this race.

Aquila rapax.

A. r. vindhiana Frankl.

The Indian Tawny Eagle is not uncommon on the plains of northern Baluchistan at all seasons, but I never found a nest. A female in the Quetta Museum was obtained locally on 12. vii., and I observed others in February, April, August, and September.

Hieraëtus fasciatus.

H. f. fasciatus (Vieill.).

Several seen at Ziarat in July at 8000 feet. Marshall found two nests with eggs on 14. v. and 26. v.

Hieraëtus pennatus (Gm.).

I frequently saw small Eagles which may have been Booted Eagles, but I never secured one. There is a pair in the Quetta Museum obtained locally on 15. iv. and 23. iv. in different years.

Buteo ferox.

B. f. ferox (Gm.).

A common bird in the plains from the middle of August to March, and occasionally seen in May. The dark and light phases are equally common, and I obtained a pair hunting together on 17. viii. which were the extremes of each phase.

Milvus migrans.

M. m. govinda Sykes.

Occurs plentifully in Quetta throughout the year, eggs being found on 26. iv. and young in the nest from 8. v. to 1. vii.; the clutch varied from two to three. In the hot weather and so soon as the rains break in the plains of India, northern Baluchistan is visited by numbers of this species, presumably from the sweltering plains of Sind or southern Baluchistan. It has been noted that Kites in Calcutta disappear during the rains (Faun. Brit. India).

M. m. migrans (Bodd.).

Fairly common but confined to the hills, though I was unable to ascertain whether it leaves in winter. A nest found on Murdar at 8000 feet on 4. v. contained one egg and two newly-hatched young. Common round Ziarat in June and July. Three examples obtained had wing-measurements of 434 and 450 mm. for the males and 472 for the female.

Elanus cæruleus.

E. c. cæruleus (Desf.).

A rare straggler. An adult was seen on 7. vii. at Quetta; an immature bird in the Quetta Museum was obtained locally on 7. iv.

Circus cyaneus.

C. c. cyaneus (L.).

A common winter visitor from the middle of October to the middle of April. Three were obtained.

Circus æruginosus.

C. æ. æruginosus (L.).

Not so common as the Hen Harrier, but can always be seen in suitable places from October to March, being most plentiful in November. Two were obtained.

Accipiter badius.

A. b. cenchroides (Severtz.).

A scarce bird of passage in October and April. I obtained males on 17. iv. and 1. x. and a female on 21. x. A pair in the Quetta Museum was shot locally on 8. iv. My specimens compare well with the series in the British Museum.

Accipiter nisus.

A. n. nisosimilis (Tick.).

Never seen from April to July in the plains, but of common occurrence near Ziarat in June, where it probably breeds. It is particularly common round Quetta in October and November. Four were obtained, a male's wing measuring 333 mm. and that of a female 435 mm.

Pelecanus onocrotalus.

P. o. onocrotalus L.

A female in the Quetta Museum was obtained locally on 14. xii. I saw Pelicans at Seranan on 9. iv., and there were several at Khushdil on 29. iv.

Phalacrocorax carbo (L.).

A few are generally to be seen at Khushdil and Seranan from November to July. It is curious that these birds remain so far inland and so far from the breeding grounds in the summer, for I have seen fully adult birds in breeding-plumage at Khushdil in June. None were obtained.

Ardea cinerea.

A. c. cinerea L.

I have seen Herons during every month of the year, but chiefly in March, April, and October. I have not heard of their breeding in northern Baluchistan.

I have frequently seen these birds far from water and feeding on lizards and toads, for which they probe in the soft earth and sand. I have seen Herons acting in the same way in the desert of northern Sinai.

Ardea purpurea.

A. p. purpurea L.

I never met with this bird, but there are two examples in the Quetta Museum of the typical European race, which were shot in March, one at Quetta and the other at Nushki.

Egretta alba (L.).

I saw several at Khushdil in March and November. Marshall found them common at Khushdil in February. None were obtained.

Nycticorax nycticorax.

N. n. nycticorax (L.).

There are several in the Quetta Museum, all obtained locally in March and April. I once saw a single adult in March.

Ixobrychus minutus.

I. m. minutus (L.). (=*Ardetta minuta*, F. B. I.)

Scarce on passage. Specimens were obtained on 27. iv., 11. vii., and 8. viii. Others in the Quetta Museum were obtained in May and September.

Ixobrychus sinensis (Gm.).

Mr. Cumming obtained a specimen at Quetta in March 1907.

Botaurus stellaris.

B. s. stellaris (L.).

A common winter visitor and bird of passage from November to March, as many as fifteen being flushed in a single day's snipe-shooting near Khushdil.

I have good reason to suspect this species of having bred at Khushdil in 1914, as on 19. vi. I heard the familiar "booming." At daylight next morning I flushed an old bird and a youngster just able to fly, but the reeds were so thick that I was unable to make further investigations.

Platalea leucorodia.

P. l. major Temm. & Schleg.

There was a flock of over a hundred at Khushdil on 26. x., and a few in November. A small party of fourteen visited the same lake on 17. v.

Ciconia alba.

C. a. asiatica Sev.

This large form of the European White Stork is represented by a single bird in the Quetta Museum, obtained at Kahan on 13. ix. 10. I never saw White Storks near Quetta.

Ciconia nigra (L.).

I saw solitary birds near Quetta in October, at the end of April, and in November. A specimen in the Quetta Museum was shot locally on 18. iii.

Plegadis falcinellus (L.).

Frequently seen in large flocks on the spring passage, and in summer as late as 12. vii. It is curious what a lot of purely gypsy flocks of birds wander about when they should be breeding. I have noted this fact among Pelicans, Storks, and Herons when the birds have been to all appearances fully adult. Can it be that these larger birds miss a year, or are they suffering from the impotence of old age, or is it pure laziness which prevents them re-visiting their breeding haunts? Among Waders, Gulls, and Ducks I believe that those which hang about in summer are all non-breeding immature birds, even though they may be in breeding dress, but among Storks and Herons I have certainly killed fully adult and healthy birds in midsummer in both tropical India and Africa, in places remote from any known breeding haunts.

Phœnicopterus roseus Pall.

I saw a flock of thirteen near Quetta on 15. iv.

A large flock settled on Khushdil Lake in early May, and proved to be so exhausted that Mr. A. B. Aitken captured and pinioned six. When the large flock flew off thirty-seven birds remained behind with the six pinioned ones till the autumn.

Anser anser (L.).

There is usually a large bunch of these Geese at Khushdil or Seranan in winter, from about the end of October to April. In 1913 six birds remained at Khushdil throughout the summer. On 19. v. 14 a flock of about forty arrived at Khushdil at 2 P.M. in brilliantly fine weather and were so exhausted and thirsty that they drank and slept the whole of that afternoon, allowing me to sit and watch them within fifty yards. They left again the next night.

The Grey Lag was the only Goose identified for certain.

Cygnus bewicki Yarr.

Mr. A. B. Aitken shot a female on Khushdil on 17. xii. 13. Wing 20 inches. Weight 14½ pounds. If the supposed eastern race of Bewick's Swan—*jankowskii*—is recognised, this bird should be placed under that name, but it seems more likely that *jankowskii* can be applied to any large example of *bewicki*, though Asiatic examples are, as is the custom with all Asiatic races, generally finer and larger birds. Buturlin found both typical *bewicki* and typical *jankowskii* breeding together in the Delta, so we must conclude they are either not geographical races of the same species, or that they are in themselves distinct species. The latter is of course out of the question, and I prefer to place *jankowskii* as a synonym of *bewicki*.

Cygnus olor (Gm.).

Large numbers visited Khushdil Reservoir about 1901, and single individuals were observed there in February 1911 and November 1913.

The Mute Swan breeds in Seistan, but the Whooper is only a winter visitor to that area (*teste* Zarudny). I believe MacMahon obtained only the Whooper and concluded that it was this Swan, which he obtained in winter, that bred there.

Tadorna tadorna (L.).

Occasional in winter. I saw six at Khushdil on 19. v. 14

Casarca ferruginea (Pall.). (= *Casarca rutila.*)

An occasional pair visit Khushdil in late winter and spring. The birds breed in Seistan and probably on the Helmund River in Afghanistan.

Anas platyrhyncha.

A. p. platyrhyncha L. (= *Anas boschas* auctorum.)

Commences to arrive in early September, and the majority have disappeared by April, but three pairs of non-breeding birds remained at Khushdil throughout the summer of 1914.

The degree of abundance of the usual Ducks to be met with at Khushdil in winter can be best seen by a table, compiled from the results of shooting between 1904 and 1914. The percentage of each species to the total bag is given :—

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
Mallard	13	30	27	1	9	10
Gadwall	24	9	5	16	9	8
Wigeon	2	1	2	2	6	5
Pintail	18	4	1	1	3	4
Shoveler	10	6	3	2	5	6
Marbled Teal	1	2	3	8	—	4
Common Teal	18	27	39	57	54	48
Common Pochard	8	14	15	10	12	11
Red-crested Pochard	1	2	2	1	—	2
White-eyed Pochard	4	3	2	1	—	1
Tufted Duck	1	2	1	1	2	1

Anas strepera L.

A regular and common winter visitor, arriving in late September and leaving in early April, though a few remain till the middle of May.

Anas acuta L.

Passes through in October and November, very few remaining in midwinter. On spring passage they scarcely linger at all, and I never saw them after early April.

Anas penelope (L.). (=*Mareca penelope.*)

A common winter visitor from late September to April. I saw a pair at Khushdil on 20. vi.

Anas angustirostris Menetr.

I believe this bird to be a summer visitor at irregular intervals and in small quantities, and a winter visitor in small numbers.

In 1913 Mr. Aitken found a Duck and fourteen ducklings on Khushdil in August. In 1914 there were six pairs on the lake throughout June and July, but I neither found nest nor saw any ducklings.

Anas querquedula L.

I saw a few at Khushdil on 19. v., and again on 13. xi. and 14. iii., but I have never seen more than one killed in a day.

Anas crecca L.

A common winter visitor, commencing to arrive on 24. viii., but not in any quantities till early September, the first few arrivals being single birds of the year. They have all departed by the end of April.

Spatula clypeata L.

A common winter visitor, but large numbers are only birds of passage. Not seen after 19. v.

Netta rufina (Pall.).

An uncommon winter visitor, occurring from October to March. It is curious that this species should be so rare, as in January and February on the Munchar Lake in Sind it was by far the commonest Duck in a bad "Duck year," and over forty were killed in one day. Their migration route must take a different line to other Ducks; or else they never tarry on their journey.

Nyroca ferina.

N. f. ferina (L.).

Vast numbers arrive towards the end of September and remain throughout the winter, the bulk leaving in late

April; but there were still hundreds at Khushdil in May and June and a few in July, whilst about ten pairs remained throughout the summer. They were seen courting in May, but there was no evidence of breeding.

Nyroca nyroca.

N. n. nyroca (Güld.).

A regular winter visitor in small numbers. I killed one as late as 18. v.

Nyroca fuligula L.

A regular winter visitor, having been killed as early as 14. viii. and as late as 17. v., but the bulk arrive in late September and leave again in April.

Bucephala clangula (L.). (= *Clangula glaucion.*)

Rare in winter—only three occurrences, in February and March.

Oxyura leucocephala (Scop.). (= *Erismatura leucocephala.*)

Rare, but in some winters considerable numbers visit northern Baluchistan, usually in October, November, and April.

Mergus albellus L.

An irregular winter visitor, sometimes in large numbers, though in other winters only a few individuals arrive. A cock in full breeding-plumage was killed 19. v. at Khushdil.

Mergus serrator L.

One was obtained at Khushdil (Baker, Ind. Ducks and their Allies, p. 283). I know of no other occurrence.

Columba livia.

C. l. intermedia Strick.

A common resident, gathering into flocks in winter. It nests in the underground irrigation channels and in cliffs up to 9000 feet.

The majority of specimens have a distinct grey lower back, but occasionally we see white-banded birds. This band in the few birds I have handled is about 2¼ inches broad and is really a very pale grey and not pure white, though it seems white when the bird is on the wing.

Eggs were taken on 14. v. and young found on 10. v.

Columba palumbus.

C. p. casiotis Bp.

Fairly common in summer at Ziarat above 7500 feet in the juniper forest. I do not know whether the birds move in winter.

The adult has vermilion legs and toes, and light lemon-yellow irides. Bill orange at the tip and horn-colour at the base. In the immature bird the tip of the bill is pinky horn-colour, gradually merging into the dark ashy colour of the head at its base. Immature birds differ from adults in having no buff spot on the neck.

Streptopelia turtur.

S. t. arenicola (Hart.).

A few stragglers occur in summer (Oates, F. B. I. iv. p. 43).

I never met with this species.

Streptopelia senegalensis.

S. s. cambayensis (Gm.).

Mostly a common summer visitor, but a few remain throughout the winter. In summer they ascend to 8500 feet, but never leave cultivated areas. First eggs found on 3. v. and last on 22. vi. Young in the nest found on 10. vi. This species usually nests in fruit trees, but occasionally on a ledge in the verandah of a house.

Streptopelia decaocto.

S. d. decaocto (Friv.).

A common summer visitor, arriving in March and leaving in October, a stray bird being sometimes seen in winter. Never noted above 6000 feet.

Six nests with eggs were found between 29. iv. and 30. vi.

Pterocles orientalis (L.). (= *P. arenarius.*)

A resident, breeding around Quetta in small numbers, eggs being found at Chaman on 29. vi.; a half-fledged young bird is in the Quetta Museum, and I saw pairs at Khushdil on 29. vii. and near Quetta on 10. vi.

Enormous flocks of these birds arrive in November, being only on passage and returning again in March.

Pterocles coronatus.

P. c. atratus Hart.

A male in the Quetta Museum was shot at Said Hamid on 23. xii. 08. No other record.

Pterocles alchata.

P. a. caudacutus (Gm.).

Arrives in large numbers in November, usually congregating near Said Hamid and watering in the Lora River. It almost entirely disappears in winter, but passes through in thousands again in the first half of March.

Pterocles senegallus (L.).

A female in the Quetta Museum was shot at Said Hamid on 26. xi. 07. No other record.

Alectoris græca (Meisner).

Common on all the hills up to 11,000 feet in summer, but never leaving them even in winter. It is equally fond of cultivation in the hill-valleys, the bare rocky slopes of some wind-swept ridge, or the glades in juniper forests of Ziarat. Young of the size of Quail were seen at 8000 feet on 31. v., and several half-grown broods in early June. Nests with nine and six eggs were found on 27. iv. and 3. v. at 8500 and 9000 feet, in each case being but a mere scratching under a thin bush sparingly lined with a little withered grass.

I very foolishly omitted to preserve specimens, so am unable to say to which race they belong.

Ammoperdix griseogularis.

A. g. griseogularis (Brandt). (= *Ammoperdix bonhami* Blanford, F. B. I.)

A common resident in suitable localities, both in the low hills and in the plains. The word "shooting" when applied to this inveterate little runner is most misleading. The word "hunting" would be more appropriate, for it is necessary to run, and run hard, over abominable ground to be successful.

Three nests with eleven, seven, and nine eggs respectively were found on 18. iv., 10. v., and 12. v. between 5000 and 8000 feet. In one case the nest was under a small rock, and in the other cases under a camel-thorn bush, being mere scratchings with a few pieces of grass and leaf at the bottom

Francolinus francolinus.

I shot an adult male of the Black Partridge at Quetta on 3. xii. 13. The nearest place to Quetta where this bird normally occurs is at Sibi, on the borders of Sind. It is therefore possible that my specimen had strayed from Sibi or that it was an escaped bird, for natives often keep it. The record being so unsatisfactory I ate the bird. The Quetta race should be *F. f. henrici* Bp., which ranges from Seistan to Sind.

Coturnix coturnix.

C. c. coturnix (L.).

Occasionally seen in the spring and autumn. I saw one in the Spin Karez on 9. viii.; and a nest with eggs, now in the Quetta Museum, was found by a native at the end of May 1914 near the town.

Rallus aquaticus.

R. a. korezewi Sar.

I obtained a male on 1. iii. and a female on 23. xi. There is also a specimen in the Quetta Museum obtained on 14. xii. No other records.

All these specimens are of the pale Asiatic race.

Porzana parva (Scop.).

This species has been observed passing through Quetta on migration (Blanford, F. B. I.). I never observed it.

Porzana pusilla.

P. p. pusilla (Pall.).

I obtained specimens at Quetta on 24. viii. and 31. viii., about which time the bird was common, though not seen at any other time.

Porzana porzana (L.).

I obtained a male on 31. x. There are specimens in the Quetta Museum obtained locally in October and November.

Porphyrio poliocephalus (Lath.).

Marshall saw seven or eight of these birds in a reed-bed near Quetta in August (B. N. H. S. xv. p. 351).

Fulica atra.

F. a. atra (L.).

I obtained a partial albino at Khushdil on 14. iii. These birds are common throughout the year at Khushdil, and occasionally come to the Lora River. Though there were hundreds at Khushdil in May, June, and July, there was not a sign of their breeding, and so far as I could ascertain this occurs every year.

Chlamydotis undulata.

C. u. macqueeni (Gray).

Only observed during the spring passage, when large numbers arrive on the plains between Pishin and the Kwaja Amran range in late March and during April, taking a heavy toll of the young wheat.

As many as sixty have been shot by four guns in a day.

Hydrophasianus chirurgus (Scop.).

A solitary individual of this unmistakable species put in an appearance at Khushdil on 11. vii. 14, having doubtless strayed from Sind, where it is common.

Burhinus œdicnemus.

B. œ. astutus Hart.

I shot a pair in the Popalzai Forest on 9. iv., but was unable to preserve them. Their wings measured 239 and 241 mm. There is a male in the Quetta Museum obtained at Seranan on 12. x. Marshall procured one in March. It is probable that this species is an uncommon resident, the country being well suited to its habits.

Cursorius gallicus.

C. g. gallicus (Gm.).

I saw a few pairs near Quetta in April 1913, but failed to secure a specimen. Marshall obtained them in September, and there is a male in the Quetta Museum obtained locally on 1. iii.

Sarcogrammus indicus (Bodd.).

I saw a pair at Seranan in February 1914, and again on the Lora River on 15. viii. Marshall obtained one in March, and there are specimens in the Quetta Museum obtained in February.

Vanellus vanellus (L.).

A regular winter visitor in large flocks from October onwards.

Chettusia leucura (Licht.).

There are several in the Quetta Museum obtained in September and December. I did not observe this species.

Charadrius leschenaulti Less. (= *geoffroyi.*)

Marshall obtained one in March at Quetta.

Charadrius alexandrinus.

C. a. alexandrinus L.

A plentiful summer visitor to Khushdil, arriving in early April and leaving in early September. Three nests with three, one, and four eggs respectively, were found on 18. v., 18. v., and 2. vi. On 20. vi. I came across three newly-hatched chicks. These birds confined themselves to the mud shores, where scrubby tamarisk was growing. I never saw them on the shingle.

Charadrius dubius.

C. d. jerdoni (Legge).

A common summer visitor, arriving in suitable localities in early March and leaving about the end of August. It breeds at Khushdil and on gravelly reaches of the lower Lora.

Five nests with eggs were found from 3. vi. to 19. vi., all at Khushdil, except one on the Lora at Seranan. The nests were close to the water's edge. Two lots of newly-hatched young were seen at Khushdil on 20. vi.

Hæmatopus ostralegus L.

Observed on passage at Khushdil on 29. iv. and 17. v.

Himantopus himantopus.

H. h. himantopus (L.).

A few arrive as summer visitors in early March and leave again in August. They bred at Khushdil in 1913 and 1914, but in the latter year a sudden rise in the water flooded all the eggs and no young were hatched. Full clutches of three were laid by 10. vi.

Recurvirostra avosetta.

R. a. avosetta L.

These birds arrive singly or in pairs in early March, but are never common. In 1914 they did not breed at Khushdil. In 1913 one pair nested there, but in handling the eggs the apology for a nest was accidentally disturbed. On the following morning a similar clutch of eggs was found on the opposite side of the lake, some 600 yards across, where there had been no nest the previous day, and the eggs had gone from the original nest. As there was but one pair of these birds on Khushdil at the time, they must have transported their eggs somehow across the lake.

Scolopax rusticola.

S. r. rusticola L.

A regular but scarce winter visitor from October to February, occurring from 5000 to 8000 feet.

Gallinago gallinago.

G. g. gallinago (L.).

A common bird of passage, commencing to arrive in mid-August, the bulk passing in September. It becomes scarce in the middle of winter, passing north again during March and a few remaining till the end of April. Eighty-three couple is the record bag, and was obtained in March 1914.

I heard a Snipe "bleating" on the Lora on 17. iii.

Gallinago solitaria Hodgs.

Until 1913 this species was only known from Quetta by a single example in the Museum, obtained in October 1909. In 1913, however, more than fifteen were shot, mostly in October and between 5000 and 9000 feet.

I shot two females on 25. x. and 23. xi.

Limnocryptes gallinula (L.).

The Jack Snipe is seldom seen near Quetta before the middle of October, but it remains till the middle of April and is particularly common on the spring passage, when I have seen as many as a hundred in a day.

Phalaropus lobatus (L.). (=*hyperboreus.*)

Two in the Quetta Museum were obtained in May and September. I shot an adult female on 28. iii. and saw others at Seranan on 6. iii.

Erolia minuta (Leisl.).

Plentiful on passage at Khushdil during October and in the middle of April. Not noted in winter. One was obtained as late as 17. v.

Erolia ferruginea (Brünn.).

Only seen on spring passage, when it was common at Khushdil from 16. v. to 20. v., in full breeding-plumage.

Erolia alpina.

E. a. alpina (L.).

Noted on autumn passage on 30. xi., and again sparingly in spring between 16. v. and 20. v. travelling with Curlew Sandpipers. The spring birds were in full breeding-plumage.

Erolia canutus.

E. c. canutus (L.).

A female was obtained on 26. iii. at Khushdil. This was a solitary bird, and no others were observed.

Philomachus pugnax (L.). (=*Machetes pugnax.*)

Only noted on spring passage, when large flocks appeared at Seranan and Khushdil throughout March. None of the males showed any signs of breeding-plumage.

Tringa totanus (L.).

I saw Redshanks at Khushdil on 19. v., when three rested there on their northward passage. One was obtained on 26. x., from a flock of eight.

Tringa erythropus (Pall.). (=*T. fuscus.*)

I shot one from a flock of eight feeding on some flooded fields near Khushdil on 26. x. 13. No other records.

Tringa nebularia (Günn.).

A female in the Quetta Museum shot locally on 9. xi. is the only record.

Tringa stagnatilis (Bechst.).

A female shot at Seranan on 15. viii. constitutes the only record.

Tringa ochropus L.

The commonest Sandpiper in autumn, winter, and spring, a few remaining throughout the year and ascending streams to over 8000 feet. No evidence of breeding.

Tringa glareola L.

Mostly a bird of passage throughout April and May, when it is plentiful. It reappears in smaller numbers in August, a few remaining for the winter.

Tringa hypoleuca L.

Common on passage from early April to the end of May. The return passage commences with August. Not seen in winter.

There was a pair of these birds on the Urak Stream throughout May and June 1914, at about 9000 feet. From their behaviour I am convinced that they were nesting, as on 3. vi. one of them disappeared. My search for the brooding bird was futile, but when I visited the place again in early August both parents and certainly two birds of the year were there.

Numenius arquatus L.

Uncommon on both passages. Noted on 9. iv., 12. viii., and 30. xi. None were obtained.

Hydrochelidon leucopareia. (=*hybrida.*)

H. l. indica (Steph.).

There were several at Khushdil throughout May 1914, when I obtained adults in breeding-plumage.

Hydroprogne tschegrava. (=*Sterna caspia.*)

H. t. tschegrava (Lep.).

A large flock appeared at Khushdil on 30. iv. 14, and remained there till 17. v. On 20. vi. there was still a pair, but they went off a few days later.

Sterna hirundo L.

Plentiful at Khushdil in May and early June, 1914. Not observed at any other time. None were obtained.

Larus ridibundus L.

A common winter visitor from the middle of October till April, a few remaining till the end of May. During the first week of March 1914 there were thousands on the Quetta plains. I never saw the breeding-plumage assumed there.

Larus argentatus.

L. a. cachinnans Pall.

A flock of twenty-four of these Yellow-legged Herring-Gulls stopped a day at Khushdil on 17. iv. 14. No other record.

Larus ichthyaëtus Pall.

A female in the Quetta Museum was shot at Seranan on 29. iii. 10. I never observed this species.

Podiceps cristatus.

P. c. cristatus (L.).

Summer visitor to Khushdil. In 1913 three nests with eggs were found by Mr. Aitken on 12. viii., one clutch consisting of five eggs. In 1914 there was only one pair at Khushdil, and I do not think that they bred, though they were there throughout June and July. There are specimens in the Quetta Museum shot at Khushdil in March.

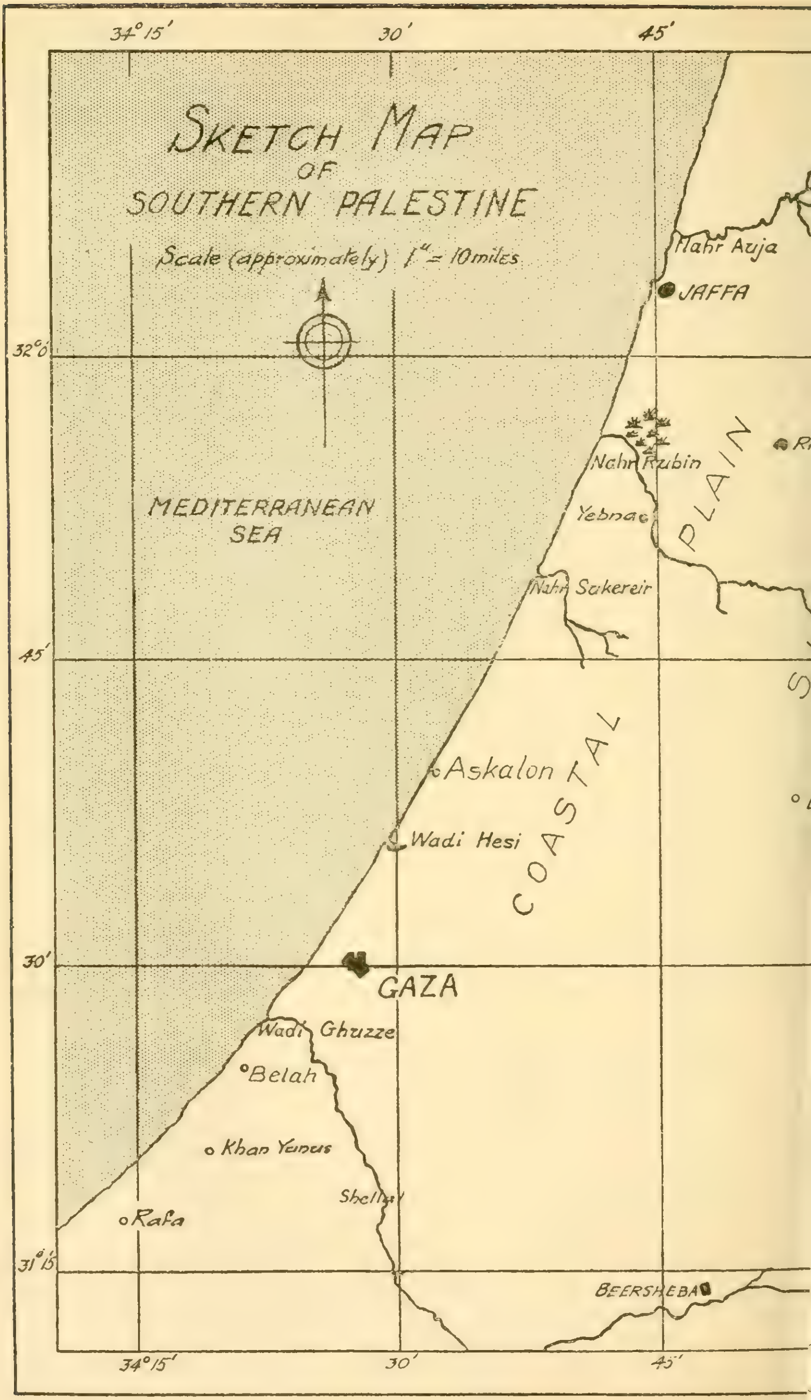
Podiceps nigricollis.

P. n. nigricollis Brehm.

There were none at Khushdil in 1913. In 1914 five pairs arrived during the first week of May, and on visiting the lake again on 20. vi. I found them there in hundreds and located over seventy nests with eggs, all confined to about an acre of water two feet deep. The nests were entirely made of weed-stalks, and measured from 15 to 18 inches across at the top. They mostly contained three eggs; two contained five eggs. In only a few cases were they concealed by weeds.

Unfortunately, owing to a heavy rainfall about 27. vi., the water rose two feet, flooding all the nests, which were firmly attached to the bottom. On revisiting the lake on 11. vii. not a nest was to be seen and all the birds had left.

This case of the Eared Grebe nesting in northern Baluchistan is interesting, as showing that the species probably migrates in flocks, that it breeds in colonies, and that it firmly attaches its nests to the weeds at the bottom, for the


SKETCH MAP
OF
SOUTHERN PALESTINE
Scale (approximately) 1" = 10 miles
34° 15'
30'
45'
32° 0'
45'
30'
31° 15'
MEDITERRANEAN SEA
Nahr Auja
JAFFA
Nahr Rubin
Yebnah
Nahr Sukereir
COASTAL PLAIN
Askalon
Wadi Hesi
GAZA
Wadi Ghuzze
Belah
Khan Yunus
Shellal
Rafa
BEERSHEBA

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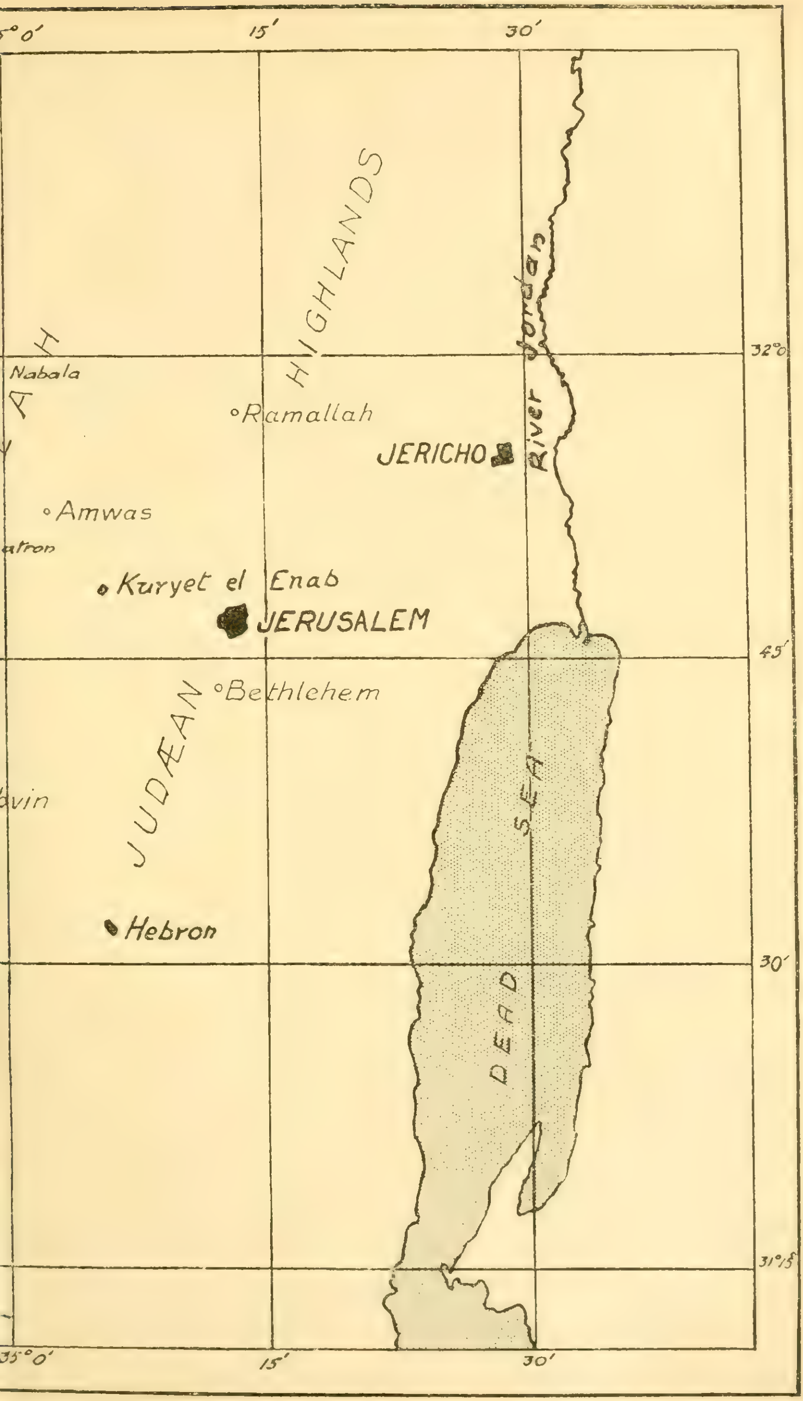
15′
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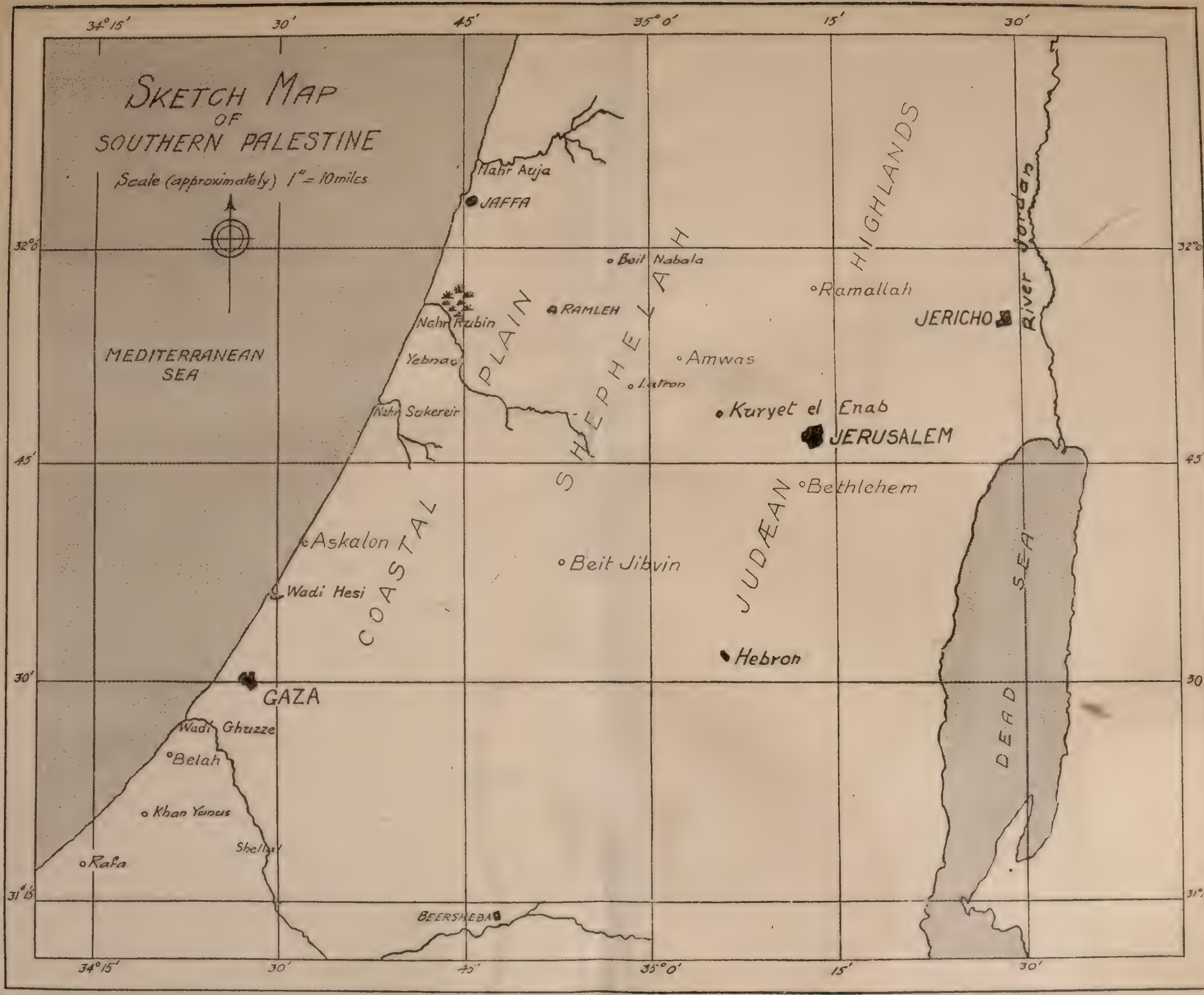
HIGHLANDS
JUDÆAN
River Jordan
DEAD SEA
Nabala
Ramallah
JERICHO
Amwas
Kuryet el Enab
JERUSALEM
Bethlehem
Hebron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JERUSALEM
Bethlehem
COASTAL PLAIN
SHEPHELAH
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Askalon
Beit Jibrin
Wadi Hesi
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GAZA
Wadi Ghuzze
Belah
Khan Yunus
Shellal
Rafa
BEERSHEBA
DEAD SEA

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structures, still with the eggs, could be seen two feet under water on 11. vii.

Podiceps ruficollis.

P. r. capensis (Salvad.). (=*albipennis.*)

Resident at Khushdil and breeding freely. Over one hundred and fifty bred there in 1913, and in 1914 I found over a hundred nests on 20. vi., mostly containing three eggs; several had four, one seven, and one six. In nearly every case the eggs were concealed by weeds. The nests were made of weed foliage and not stalks, and never measured over 12 inches across the top.

When the previous species was flooded out this Grebe scored by having its nest floating, and on 11. vii. all eggs were hatched except in two cases.

Though this species occurs at Khushdil in large numbers it is probable many go south at the approach of cold weather, for they did not seem so numerous in winter as they had been after the young were hatched.

IV.—*Notes on the Birds of Southern Palestine.*

By Colonel R. Meinertzhagen, M.B.O.U.

(Plate II.—Map.)

The following paper is based on a collection made by Colonel Lord W. Percy, Major Maurice Portal, and myself from May 1917 to March 1919, though considerable intervals occurred when, for various reasons, no work could be done. The bulk of the collection was made at Rafa in the autumn of 1917 and round Ramleh in 1918, whilst Major Portal visited Mount Carmel, the Jordan Valley, and several spots on the Judæan highlands.

A few additions to our notes have been borrowed from Major Sladen's paper in 'The Ibis' of April 1919, and I have made free use of some valuable information from Brig.-Gen. Clarke.

We owe much to the kindness of Mr. M. J. Nicoll, of the

Giza Zoological Gardens, for the free use we were able to make of his knowledge of the birds of the Near East, for housing and care of the collection, and finally for packing it up for shipment to England. I also must discharge a debt of gratitude to Dr. Hartert for the great help which was always available at Tring whilst working out the collection; and, finally, our thanks are due to Trooper L. H. Powell of the Gloucestershire Yeomanry, without whose services the collection would not have been possible, and whose skins have been so much admired by all who have seen them.

Corvus corax.

C. c. laurencei Hume.

Three males were obtained near Ramleh on 1. i. and 1. ii. Their wings measure 404, 405, and 430 mm. These birds do not differ from specimens from Baluchistan, and they are the normal Ravens in northern Palestine, the southern limit being a line drawn roughly from the Mediterranean at the mouth of the Wadi Sukereir in the latitude of Jerusalem, south-east to a point between Hebron and Bethlehem, and thence in a north-easterly direction towards the north end of the Dead Sea. They are resident and equally common on the coastal plain and the Judæan highlands, and are also abundant on Mount Carmel, but absent from the Jordan Valley.

Major Portal describes the courtship in the following words: "The cock sat on the top of a tree, courting the hen who was sitting below in the branches. I never heard such a variety of sound, for after the preliminary croaks he bubbled and clucked more like a parrot than a raven. The hen paid little attention, for she had just swallowed some meat with an opium pill and was drowsy; but the exasperated cock, mistaking her indisposition for inattention, suddenly fell on her and drove her away."

C. c. ruficollis Lesson. (=*umbrinus.*)

A common resident in northern Sinai, southern Palestine to just north of Gaza, east to Hebron, the Dead Sea, and the Jordan Valley. The wing of a male measures 384 mm., and that of a female is exactly the same. In freshly moulted specimens the brown is almost absent.

Large numbers of these birds roost in the sand-dunes on the north Sinai coast from August to March. The flight of these desert birds is very strong and they can chase and catch Dotterel, which though possibly wounded, could still fly high and fast. It was no uncommon sight near Rafa in winter to see a pair of these Ravens away up in the heavens pursuing a Dotterel, which they eventually brought to ground. I am told that Ravens have been seen in Scotland pursuing Rock-Pigeons with success, but beat them down in flight with their wings.

The Arabs call this bird Ghurab el Nohi, believing it to be the Raven which Noah liberated from the Ark.

Corvus rhipidurus Hart. (= *affinis.*)

The Fan-tailed Raven was only observed in the Dead Sea and Jordan depression. There were two pairs nesting in cliffs near Jericho on 2. iv. They are very wild and difficult of approach. None were obtained.

Corvus cornix.

C. c. syriacus Gengler, J. f. O. April 1919, p. 221.

On 14 May, 1919, I described the Palestine Hooded Crow as *Corvus cornix judæus* (Bull. B.O.C. no. ccxliii.), but this name must now become a synonym of *syriacus* which has a month's priority. Gengler bases his subspecies on a male and two females from Jerusalem.

This race is much smaller than true *cornix*, and has a slightly darker and browner mantle. The wings of seven Palestine birds vary from 278 to 305 mm., while typical *cornix* usually varies from 320 to 340 mm. Egyptian Hooded Crows are indistinguishable from European specimens, though they have a slightly smaller wing-measurement, five in the Tring Museum varying from 308 to 318, while Nicoll tells me his specimens are usually between 293 and 318, the largest bird being 357 mm. The bill of the Palestine bird is noticeably smaller than that of Hooded Crows from any other part of the world.

This race occurs as a breeding species from Khan Yunus just south of Gaza, north along the coastal plain to Acre, but is absent from Beersheba and Hebron. It is common in the Judæan highlands about Jerusalem, but scarce in the Jordan Valley. Tristram mentions Hoodies as common east of the Jordan in Moab and Bashan, but I have not seen specimens from there.

I noted a slight movement of Hoodies near Rafa about the end of September, and a few Palestine birds may stray to El Arish and even Egypt in winter.

Most of the nests found were in palm trees, while at Ludd two broods of young were hatched by 20. vi.

Corvus frugilegus.

C. f. frugilegus L.

A regular winter visitor in large flocks to southern Palestine. It commences to arrive about early November and to start north on 2. ii. Departures were observed on 5. ii., and all were gone by 2. iii.

Of three obtained, a female shot on 3. ii. had enlarged ovaries and showed no signs of losing her nasal bristles. Tristram remarks that only two out of twenty adults shot in spring showed any signs of denudation at the base of the bill, and it was remarked that most of the winter birds still had nasal bristles. One obtained on 24. xii. agrees as regards its bill with the Asiatic race "*tschusii*," but has a wing of only 314 mm. Another male shot on 5. i. agrees well with British specimens, and has a wing of 318 mm.

Tristram noted "rookeries" at Jerusalem and Nablus, but these appear to have vanished.

It seems possible that the Carrion Crows reported by Sladen (*cf.* Ibis, April 1919) were merely Rooks which still retained their nasal bristles.

Colœus monedula.

C. m. collaris (Drummond).

A few are to be found among most flocks of Rooks from early November to early February. The birds were not observed in summer, except near Jericho in May, where they were breeding in cliffs and sitting on eggs on 1. v.

One obtained near Ramleh on 5. ii. compares well with specimens from Bosnia as regards its under parts; but the nuchal collar is no lighter than in British specimens.

Garrulus glandarius.

G. g. atricapillus Geoffr.

A local resident in the Judæan hills and on the foothills of the Shephelah, being by no means rare where it occurs. It lays three or four eggs in a typical nest in a small bush near the ground.

Of four obtained, two males have wings of 182 and 190 mm., and two females have wings of 175 and 187. The amount of white on the forehead shows great variation, sometimes being confined to the forehead proper, and at other times extending nearly to the crown. The colour of the back varies in birds even from the same locality, a specimen from Jerusalem being very pale, which does not appear to be due to bleaching.

Amydrus tristrami Sclater.

Found in the gorges south and south-west of Jericho and in the wadis running into the Dead Sea on the west side. It probably also occurs throughout the Dead Sea depression, south to Petra, and possibly elsewhere in N.W. Arabia.

The nest is an untidy collection of sticks and roots placed on the ledge of a cliff.

Sturnus vulgaris.

S. v. sophiæ Bianchi. (=*jitkowi* But.)

S. v. purpurascens Gould.

Several examples of both these forms were obtained from 28. x. to 8. i., the two races being invariably mixed up in the same flock.

Starlings arrive in their thousands in southern Palestine in the last days of October, the first flocks appearing to pass on towards Egypt mostly flying at a height of about 400 feet. In winter they are more numerous around Gaza and Rafa than further north. Not observed in the hills of Judæa or the Jordan Valley, and entirely absent in summer.

Pastor roseus (L.).

An immature bird shot at Rafa on 10. viii. was the only one observed.

Oriolus oriolus.

O. o. oriolus (L.).

A bird of passage in fair numbers in southern Palestine, and confined to the coastal area. It commences to arrive about 20. viii., the immature birds and females arriving first, the adult males following in the first week of September. At Rafa it was common till 20. ix., and the last seen was a female on 3. x.

On spring passage the cocks pass through first, from about 18. iv., and the passage was complete by 11. v. None were observed in summer or winter.

Coccothraustes coccothraustes (L.).

A male was seen on Mount Carmel on 22. iv. and another in the Jordan Valley in March. Not obtained.

Chloris chloris.

C. c. chlorotica (Bp.).

Common resident in suitable places throughout southern Palestine, south to Khan Yunus, north to Carmel, and east to Jerusalem and Hebron. It commences building in late March, usually selecting an olive tree and placing its nest about eight feet from the ground. The structure is composed of bents and grass-stalks, lined with finer grass and horse-hair. A remarkable nest, composed entirely of horse-hair, was seen by Clarke in a eucalyptus tree. Fresh eggs were found from 10. iv. to 22. iv., but one clutch of five was obtained by Sladen as early as 14. iii. This species is double-brooded.

Six males obtained have wings varying from 81 to 86 mm. This race is so near *aurantiiventris* as to make it somewhat difficult to determine, but it is very slightly paler on the back and under parts and has, as a rule, a smaller wing.

Carduelis carduelis.

C. c. hærmsi Reich.

Sladen is wrong in referring the Palestine Goldfinch to the typical race. We obtained altogether fifteen specimens, and they agree exactly with birds from Eregli in Asia Minor. This form appears to extend to the Caucasus, Asia Minor, and Cyprus, and the races *minor*, *loudoni*, *brevirostris*, *niedecki*, and *colchicus* will probably all be found to be synonymous with it. The wings of fourteen males vary from 75 to 78 mm., whereas typical *C. c. carduelis* has a wing varying from 79 to 84 mm. The back of *hærmsi* is paler and the breast-patches are earthy-grey.

The Goldfinch occurs as a resident throughout southern Palestine from the coast to the Jordan Valley, being seen in the latter place in flocks in March; it was not observed west of Khan Yunus. It commences to build in the middle of March, and both eggs and young were found in the middle of April. A nest found eleven feet from the ground in an almond tree was made of dead grass, decorated with pieces of cotton and twine, grass-seeds, and cotton-wool. The cup was lined with white seed-down and a few horse-hairs, mostly woven round the lip.

Acanthis cannabina.

A. c. fringillirostris (Bp. & Schleg.).

Four examples were obtained in October from Artuf, and five from Mount Carmel in April, where they were breeding. These birds compare well with specimens from Turkestan and Asia Minor. The wings of five males measure 80 mm., and of two others 82 and 83 mm. respectively.

Serinus canaria.

S. c. serinus (L.).

A plentiful winter visitor to the coastal plain and Judæan hills, being sometimes seen in flocks of over two hundred. No record was made of their dates of departure and arrival. The wings of two males measure 71 and 72 mm. respectively.

Rhodospiza obsoleta (Licht.).

Thirteen specimens were obtained from 31. x. to 23. iii. This species appears to be only a winter visitor and occurred in large numbers near Ramleh, the first arrivals being observed on 26. x., while the last noted was on 24. iii., when the birds were in flocks of a hundred or more.

The wings of seven males vary from 83 to 87 mm., but are mostly 85. Those of five females vary from 79 to 84 mm.

Fringilla cœlebs.

F. c. cœlebs L.

A common winter visitor throughout the country, first arrivals being noted near Rafa on 11. ix., when a flock of females appeared. In the following year at Ramleh it was not noted till 15. xi., when large flocks of females appeared. All the flocks had gone north by 12. iii., only single hens remaining, the last being seen on 22. iii. A few were seen at the north end of the Dead Sea in November.

Passer domesticus.

P. d. biblicus Hart.

A plentiful resident, breeding in wells and houses. About early October it commences flocking and is subject to local movement in search of food. The nests vary much in size and structure, some being small and unlined, others being masses of grass 16 inches across and thickly lined with feathers. A nest placed in a tree on Mount Carmel on 23. iv. was 30 feet from the ground and contained six eggs. This race of Sparrow ranges in northern Sinai at least as far west as Rafa.

Passer moabiticus.

P. m. moabiticus Tristr.

Confined to the Dead Sea depression and the lower Jordan Valley. It appears to have extended its range in recent years from the south end of the Dead Sea, and now occurs in the Jordan swamps about three miles north of the Dead

Sea, where it breeds, the young having flown by 7. v. The nests are placed in tamarisk bushes about five feet from the ground and clear of flood-line, and are constructed of dead interlaced tamarisk needles. They are huge cone-shaped structures with an entrance at the top or on the side of the top. The base of the cup is lined with Chukar and Francolin feathers and cotton-down. One nest was 16 inches deep and 6 inches in diameter.

The birds were plentiful at the north end of the Dead Sea in November and June, but absent in late February and throughout March. Five were obtained in November.

Passer hispaniolensis.

P. h. transcaspicus Tschusi.

Locally plentiful in the coastal plain and in the Jordan Valley, being resident. It does not appear to occur much south of the latitude of Jerusalem. The wings of five males vary from 75 to 80 mm.

Emberiza calandra.

E. c. calandra L.

Mainly a winter visitor, being commonest in the coastal plain. Near Gaza these winter birds first appeared on 10. x., and in a few days many thousands watered on the Wadi Gaza from Gaza to Beersheba, but they suddenly disappeared on 18. xii.

Near Ramleh they remain as late as 31. iii.

There are also some resident birds in the valleys of the Shephelah and locally in the coastal plain. In winter these residents never flock, and can be seen singly or in pairs in January or December, sitting on top of thorn bushes rasping out their note, while a flock of winter birds as wild as hawks may be feeding close at hand.

Of nine obtained, the wings of the males vary from 90 to 99 mm. and those of the females from 89 to 93 mm. All examples except two can be matched by others from southern Europe and by dull-coloured specimens from Great Britain. Two females, however, are noticeably different. One shot on 23. xi. is a richly coloured rufous bird, and compares well with typical British examples. The other, shot on 22. iii., is a light coloured bird with a bleached appearance, even lighter than the palest Turkestan specimens.

I commend the Corn Buntings of Palestine to Mr. Bannerman.

Emberiza melanocephala Scop.

A summer visitor to southern Palestine, keeping mainly to the coastal plain and becoming less common near Gaza. Earliest arrivals were noted on 26. iii., the males preceding the females, and the latest on 4. xi., so it is possible a few remain for the winter.

In spring one or two pairs can always be found in every orange grove, the birds preferring those which have been cut back. The nests were never more than three feet from the ground and occasionally almost touching it. The nest is usually in an orange tree, but sometimes in low scrub on a bank. An abnormal nest found by Clarke was entirely made of a species of yellow flowering trefoil, which was in full bloom when it was found.

Of eight birds obtained the wings of males vary from 89 to 97 mm., being mostly between 92 and 94.

Emberiza hortulana L.

Only observed as a bird of passage. In spring it commences passing north in the coastal plain from 17. iii. In autumn at Rafa it was first observed on 8. ix., singly and in small family parties. The numbers increased on 17. ix., but became less on 28. ix., and none were seen after 5. x. No adult male was observed in autumn.

Emberiza cæsia Cretzs.

A summer visitor and bird of passage to southern Palestine, breeding on Mount Carmel, where eggs were hard-set on 28. iii., as well as south to Ramleh and in the Judæan hills.

In autumn it commences moving south at the end of August and gradually works its way across northern Sinai, apparently in a south-westerly direction, to its winter quarters, presumably in the Sudan. The passage was at its height during the first three weeks of September, it became scarce on 24. ix., and none were seen after 4. x. In spring the breeding birds commence to arrive in the first week of March or even earlier. But those passing to breeding quarters further north were still in small flocks at Ramleh on 20. iv.

Of thirteen specimens the wings of males vary from 80 to 87 mm., while those of females measure 81 mm.

Emberiza pyrrhuloides.

E. p. korejewi (Sar.).

A single female of this race described by Sarudny in 1907 (Orn. Monats. 1907, p. 83) from Seistan and Persian Baluchistan, was obtained by Percy in the Wadi Rubin on 6. ii. Wing 78 mm. It agrees with Seistan specimens, also with a bird from Syria in the Tring collection. The bill is perhaps a shade smaller, but without a series for comparison such a difference may be merely due to individual variation.

Melanocorypha bimaculata.

M. b. gaza Meinertz.

I described this new race of *bimaculata* in the Bull. B.O.C. ccxliii. May 1919, p. 84. It differs from the typical form in its whole upper parts being much more rufescent and in having a pale buff instead of a white eye-stripe. The black patches on the sides of the breast are smaller, more confined, and more widely separated. A continuous band of dark brown spots extends across the chest, whereas in the typical form these spots never stretch across the chest and only occur in rare instances even on its sides. Bill very much smaller and stumpier. Wings of two males 115 and 116 mm. and of two females 108 and 116 mm. One unsexed has a wing of 115 mm.

These Larks occurred in immense flocks on the Wadi Gaza from 10. viii. till the end of October, coming to water in the morning and evening; as many as twenty were once secured at a shot. Their flight was particularly strong. None were seen after the middle of December.

This species (though, as no specimens were kept, I cannot say of which race) is a common breeding bird near Gaza, the first eggs being found on 8. iv. and fledged young seen on 6. v. A few breed near Jaffa.

Tristram described this species as breeding high up in Lebanon and Hermon. Those represent the typical form, which also occurs in Syria in summer. It is, therefore, probable that this new race is confined to Palestine proper, and will be found in winter in Egypt and the Sudan.

Calandrella brachydactyla.

C. b. longipennis (Eversm.).

The resident Short-toed Lark of Palestine should be the typical form, but in southern Palestine, on the borders of Sinai, we found this race breeding abundantly in May and June. In early August they flock, and in early September they move elsewhere. We had no opportunity of observing their spring arrival.

C. b. rubiginosa Fromh.

A bird of this race was shot on 18. viii. at Shellal. Its status in Palestine is not known, but Nicoll tells me that he has found it breeding in Egypt, and it is possible it also nests in some locality in Palestine where other forms do not occur, possibly in Sinai proper and south of *longipennis*. In any case the Short-toed Larks of Palestine furnish us with an interesting problem, which with our scanty material we cannot hope to solve.

Some race of this Lark breeds at Esdud and Jaffa, Clarke having taken eggs on 6. v.

Calandrella minor.

C. m. minor Cab.

This species was certainly in the minority in southern Palestine and northern Sinai, and was not observed in the breeding season.

Of seven specimens obtained, the adults compare well with similar birds from north-west Africa. Four birds of the year obtained are much more rufescent, the dark markings on the back and crown being less conspicuous than in adults.

Ammomanes deserti.

A. d. fraterculus Tristr.

A local resident in suitable country, being found at Shellal on the Wadi Gaza, at Beersheba, and near Jericho. This race apparently extends east to the Persian Gulf and north to Kuryatein in the Syrian desert. Of six birds obtained the wings of males vary from 92 to 99 mm.

Galerida cristata.

G. c. brachyura Tristr.

An abundant resident in northern Sinai, southern Palestine, and north to Jaffa. It occurs in both the coastal plain and in the Judæan highlands south of Jerusalem. North of the line Jaffa-Jerusalem birds tend towards *cinnamomea,* though a specimen from Carmel, whence the type of this race was obtained, on being compared with the actual type of *cinnamomea* cannot be referred to it. Hartert (Vög. pal. Fauna, p. 235) remarks that birds from Jerusalem and Asia Minor are intermediate between *cinnamomea* and *brachyura.* I do not wish to question the validity of *cinnamomea* as a subspecies, for the two specimens in the Tring collection, both from Mount Carmel—one of which is the type—are absolutely distinct from any of the fifteen *brachyura* we obtained in southern Palestine, being of a rich cinnamon-red on the upper parts. I am, however, unable to distinguish *G. c. eritreæ* Zedlitz from the west Red Sea littoral from *brachyura.*

As regards the Crested Larks of Palestine, one can only say that typical *brachyura*, stretching from both shores of the Red Sea north to the line Jaffa-Jerusalem, becomes redder in the Judæan highlands and north of the Jaffa-Jerusalem line, birds from Carmel and possibly elsewhere in such places as the Lebanon and Hermon, being typical *cinnamomea*, whilst surrounding *cinnamomea* occur examples which are intermediate between that race and *brachyura.*

Brachyura breeds freely in southern Palestine, full clutches being found near Gaza from 30. iii. and round Ramleh from 20. iii. Second broods can be seen till late June or early July. A large desert Lizard takes great toll of both young and eggs of this Lark.

Lullula arborea.

L. a. pallida Sar.

This pale race of the Wood-Lark was met with near Hebron in the Judæan highlands on 8. xii., when it was fairly common in small flocks on the rocky hill-sides. It was also found near Ramleh in small flocks in the following December. Odd birds were shot on 5. ii. and 15. iii. Tristram describes them as resident. Perhaps they are.

Of five obtained the wings of three males measure 94, 96, and 100 mm.

Alauda arvensis.

A. a. contarella Bp.

A. a. cinerea Ehmcke.

Of three winter birds obtained I am compelled to refer two to *cinerea* and one to *cantarella*, the latter being shot from a flock of about twenty birds, another of which proves to be *cinerea*. The other *cinerea* was shot on 9. xi.

On comparing these specimens with a large series of both forms, I found that *cantarella* and *cinerea* intergrade a great deal, and birds frequently occur which one cannot with certainty refer to either race; but our specimens are typical, the *cantarella* comparing well with Italian birds, and the *cinerea* matching Turkestan specimens.

Skylarks put in their first appearance in southern Palestine at Rafa on 31. x., when both races were obtained. By 3. xi. the whole country was a mass of Larks from Rafa and Beersheba north to Jaffa and Hebron. Their numbers showed a marked decrease about 4. xii., but they were still plentiful throughout January. In Central Palestine, at Tulkerām, many tired flocks were seen on 21. x.

On spring passage there were many flocks passing Ramleh on 19. iii.

The birds were not seen in summer and certainly do not breed in southern or central Palestine.

Anthus campestris (L.).

A resident scattered in isolated pairs throughout the country and nowhere abundant. Observed from Rafa and Beersheba north to Carmel, Jerusalem, and the Jordan Valley. It was found in the coastal area in summer and in the Jordan Valley in March. It is probable that a good many undertake a local movement from the highlands of Judæa to the Gaza-Beersheba plains of northern Sinai in winter.

Of six birds obtained, the wings of four males measure 85, 86, 92, and 97 mm. One of these small-winged birds was shot in the pure desert at Shellal and is a paler and yellower bird than any others I have seen, so much so that it is difficult to refer it to *campestris* at all. Its small size and yellow colour are quite remarkable, and yet it can be nothing else but this species.

Anthus sordidus.

A. s. captus Hart. (=*A. leucophrys captus* Hart.)

This fine Pipit is confined in Palestine to the Judæan hills north of Jerusalem and to Mount Carmel, descending to the Jordan Valley and the coastal plains in winter. Its northern limit was not ascertained.

Our six specimens compare well with the type, also with another Palestine bird, and with a series which I obtained in Baluchistan. All our birds are males, with wings varying from 90 to 94 mm.

Anthus trivialis.

A. t. trivialis (L.).

A bird of passage to southern Palestine, but only noted in autumn. It commenced to arrive on 8. ix., but it was not till 16. ix. that they became common in small parties. Last seen on 28. x. Four examples were obtained.

Anthus pratensis (L.).

Quite rare in southern Palestine and only met with near Hebron on 8. xii., and in the Shephelah in late December and early January. It does not seem to leave the hills, and was not observed in summer. Four examples were obtained.

Anthus cervinus (Pall.).

A common bird on autumn passage, a few remaining through the winter in southern Palestine. First arrivals noted at the mouth of the Wadi Gaza on 10. x., mostly flocks of young and adults still in breeding-plumage. Large companies appeared round Rafa from 11. x. to 22. x. and then passed on, though they were still plentiful near the coast at Gaza. A few were seen near Jaffa and Gaza in December and January.

Only noted on spring passage at Jaffa from 12. iv. to 27. iv.

Birds were in full change from summer to winter plumage in October, but a few with red throats were observed to the end of November. No red throats were seen after the middle of December.

Anthus spinoletta.

A. s. coutellii Sav.

Common at the mouth of the Wadi Gaza on 13. xi., but not otherwise noted though possibly overlooked. These Pipits can be at once recognised in the field by the erect angle of their tails, which is most noticeable when seen in company with *cervinus* or *trivialis*.

One obtained on 13. xi. has a wing of 82 mm. The specimen is in full winter plumage.

Motacilla flava.

M. f. flava L.

A common bird of passage in spring and autumn in southern Palestine. Small family parties of old and young commenced appearing at Rafa on 7. viii., and became fairly plentiful after 21. viii. Plentiful throughout September and to 8. x., after which date the numbers decreased, and none were seen after 19. x.

On spring passage they moved north along the coastal plains from 20. iii. to 23. iv. in flocks of forty and fifty. One was shot at Jerusalem on 18. iv.

Of nine examples obtained in spring and autumn, all are typical *flava flava*. I note that Sladen (Ibis, April 1919) refers his specimens to *flava beema*, and in view of the identification having been made by Ogilvie-Grant, I do not question its accuracy. But it is nevertheless remarkable that Sladen's birds should be *beema* and ours typical *flava flava*. I regret I have been unable to examine Sladen's birds.

M. f. dombrowskii (Tschusi).

A very typical adult male of this race was obtained at Ramleh on 22. iii. Its occurrence so far east is interesting.

Motacilla melanocephala.

M. m. melanocephala Licht.

I prefer to keep the Black-headed Wagtails separate from the *flava* group.

An uncommon bird of passage in spring and autumn, being obtained from 2. ix. to 17. ix., and again on 22. iii. A flock of from forty to fifty were noted at Ramleh on 20. iii.

Motacilla citreola.

M. c. citreola Pall.

A solitary bird obtained at Shellal on 23. ix. is referred to this race. It is in immature plumage and difficult to identify, but in view of the locality and its small size (wing 81 mm.) I place it under this race, though in plumage it exactly agrees with *citreoloides* in immature plumage from Assam. I have been unable to compare it with examples of *citreola citreola* in similar plumage.

Motacilla cinerea.

M. c. melanope Pall.

A bird in winter plumage was obtained near Jerusalem on 23. i., and proves to be the eastern race of the Grey Wagtail. Not otherwise seen, though Tristram notes Grey Wagtails as not uncommon in winter.

Motacilla alba.

M. a. alba L.

A bird of passage on both migrations and a winter visitor to southern Palestine. In the autumn it first appeared at Rafa on 2. x., and became plentiful throughout the country after 6. x. There was a considerable decrease in the numbers towards the end of October and again in early December. A few remained in the Shephelah and on the coastal plain in January and February. On several occasions flocks of 300–400 could be seen on the north Sinai desert roosting in thorn trees.

In spring flocks commenced to arrive from the south as early as 25. ii. None seen in summer.

Cinnyris osea.

C. o. osea Bp.

This bird is now generally distributed throughout the coastal plain from Gaza at least as far north as the southern slopes of Carmel. It does not appear to exist in the Judæan Hills but occurs again in the Jordan depression. It seems to be found in the above localities throughout all the year.

At Haifa, north of Carmel, it was plentiful in February and March, became scarce towards the end of April and then disappeared. None breed at Haifa.

Of six obtained the wings of four males vary from 52 to 54 mm. A bird of the year, a male, shot on 9. xi., has almost assumed adult plumage on the back, whilst its head and lower parts have scarcely an adult feather in them.

Parus major.

P. m. terræ-sanctæ Hart.

This race appears to be but a small form of *zagrossiensis* described by Sarudny from south-west Persia. Birds from the Lebanon have slightly larger wings—73 mm.—but do not differ in any other way. *Terræ-sanctæ* also has a very slightly darker back than *zagrossiensis.*

Seven males in our collection have wings from 65–71 mm., and three females have wings from 66–70 mm.

The southernmost point on the coast where this bird was observed was Askalon just north of Gaza, and the most northerly point the Lebanon. Observed at Jerusalem in winter, but not seen in the Jordan Valley.

Sladen (Ibis, April 1919) refers the Palestine Great Tit to *blanfordi*, which is confined to the country just south of the Caspian. This certainly is an error.

This Tit nests in holes in walls or olive trees. Seven half-fledged young were found at Ramleh on 27. vi. The bird is quite common throughout the coastal plain and the hills of Judæa.

Lanius minor Gm.

Fairly common on autumn passage at Rafa, but not noted in spring anywhere in southern Palestine. Tristram notes that this species is very irregular in its visits, only being seen once between 1858 and 1872, but was very common on passage in the middle of May 1882 (Ibis, 1882).

During autumn passage at Rafa the first arrivals appeared on 14. viii. and the bird soon became common, adult birds predominating. They became scarce at the end of August, the last seen being on 2. ix. This species is a very early migrant, the period of passage being comparatively short. Lynes (Ibis, Jan. 1912) noted the passage in Egypt to last from mid-August to mid-September, whilst on the west coast of Asia Minor birds were moving south from 7. viii. to 13. viii. They pass through Armenia from mid-August to early September, through Yemen in early September, arriving in Rhodesia about October.

Lanius excubitor.

L. e. elegans Swains.

The resident Shrike of northern Sinai and southern Palestine, at least as far north as the line Jaffa-Jerusalem, but becoming scarce north of Gaza. Recently fledged young were being fed at Belah on 3. vi., but no nests were found.

Of nine obtained, the wings of the males vary from 112 to 115 mm., and those of the females from 107 to 110 mm. The immature plumage of this race scarcely ever has a trace of the crescent markings usual in the young of other races of *excubitor*.

These Shrikes feed largely on small lizards and beetles, but will attack wounded or caged birds as large as themselves, one having been known to make a most determined effort against a full-grown Cream-coloured Courser. A Shrike, possibly of this race, was seen to chase and kill a Sunbird in the Jordan Valley. Throughout the summer these birds could be seen perched on cactus hedges or telegraph-wires, perpetrating the most varied selection of noises ever heard, sometimes very melodious and at other times insistently raucous and rasping. During the operation they puff out the feathers of the head and neck, turning from right to left in their self-satisfaction at each new operatic effort.

They adapted themselves quickly to the mass of barbed wire round Rafa, and more than one "larder" was found spiked on the barbs.

Lanius senator.

L. s. niloticus Bp.

The Eastern Woodchat was only once seen on autumn passage at Rafa—on 21. viii.—which is curious, as it is such a common summer visitor to the coastal plains of southern Palestine, breeding very commonly on Mount Carmel. These breeding birds commence to arrive about the middle of March, full clutches of seven fresh and five incubated eggs being taken on 24. iv. and 26. iv. respectively, the larger clutch being of the greenish-blue type and the smaller clutch the pink type. The first nest was placed five feet from the ground on the outer branch of an almond tree. It is a compact structure of grass, weed-stalks, and fibrous roots, without lining. The inside measurements of the cup are 80 mm. from lip to lip, and 60 mm. deep. The second nest differed from the first in being thickly lined with sheep's wool.

Lanius nubicus Licht.

A common bird of passage in southern Palestine, only breeding in the northern parts. On autumn passage it commences moving south on 9. viii. The passage continues throughout August to early September. After 10. ix. it was scarce, and only one was seen after 19. ix., and that an immature bird on 3. x. In spring it commences moving north about 12. iii., and soon becomes common, the main passage being over by the end of the month, and only belated birds being seen in April.

Lanius collurio L.

Only noted on autumn passage. First observed on 15. viii., when an adult male arrived on the desert near Rafa. Several were seen on 18. viii., after which date they became common. No immature birds were observed till 24. viii., when they began to predominate. No adults were seen after 30. viii., and immature birds did not become scarce till 23. ix., the last seen being on 30. x.

It was noted that adults kept almost entirely to the open country, whilst immature birds confined themselves to gardens. This seems due to the fact that the adults pass straight through, whereas the immature birds require food and rest on their journey.

Pycnonotus capensis.

P. c. xanthopygos (Hemp. & Ehr.).

The Palestine Bulbul is resident in the southern districts along the coastal belt from Gaza north to Mount Carmel, where it becomes scarce. None were seen in Haifa or Acre. It is common in the Shephelah north of Beit Jibrin, but absent from the hills of Judæa, though an abundant breeding species in the Jordan Valley at its southern end.

It breeds freely in cactus hedges or orange trees, and Clarke found two nests in reeds. The rather large structure is composed of dried grasses, sometimes with a few dried leaves worked in, and lined with fine dry grass. Four incubated eggs were found at Jericho on 13. iv., and in the coastal plain fresh eggs were found from 26. iii. to early June.

Muscicapa striata.

M. s. striata (Pall.).

The five autumn birds brought home belong to the western race and compare well with British and Continental specimens. These birds passed Rafa in autumn, commencing from 16. viii., and soon became common, especially so from 24. viii. to 21. ix. They were scarce after 29. ix. The last was seen on 16. x.

Flycatchers breed in southern Palestine, but unfortunately no summer birds were obtained, for these may belong to the eastern race. There were many breeding round Jaffa on 23. v., and five young in the nest were found at Ramleh on 3. vii.

Muscicapa albicollis Temm. (= *collaris* Bechst.)

Two immature males shot at Rafa on 10. x. were the only ones we saw on autumn passage. A pair was obtained later on Mount Carmel on 17. iv. and 26. iv. Not otherwise seen.

Phylloscopus collybita.

P. c. collybita Vieill.

The Chiffchaff was not observed on autumn passage at Rafa till 27. x., when a few appeared. After that date, and until at least early January, an odd one or two could be seen in the gardens. They were fairly common on the bush-clad slopes of the Shephelah in December and January.

The wings of four obtained measured from 56 to 62 mm.

Phylloscopus trochilus.

P. t. trochilus (L.).

Autumn passage at Rafa commenced on 22. viii., after which date the species became common. The maximum number occurred towards the end of September and in early October. After 7. x. it fluctuated daily, the birds being in hundreds some days and absent altogether on others. None seen after 24. x.

No records were made of spring passage. None were seen in summer or midwinter. Of ten obtained, the wings of seven males vary from 64 to 70 mm.

P. t. eversmanni (Bp.).

The first bird of this race noted for certain was on 26. ix. A few could be seen in early November, and a large influx occurred on 22. xi. They became very scarce after 29. xi., only one or two being seen in December.

The wing of a female measures 71 mm.

Phylloscopus bonelli.

P. b. bonelli (Vieill.).

An early passage migrant in southern Palestine, occurring in small parties from 14. viii. to 2. ix., after which date none were seen. Four birds were obtained; all belong to the western race. Both western and eastern races occur in Egypt in winter, the latter predominating.

Lusciniola melanopogon.

L. m. melanopogon (Temm.).

A few occurred at Rafa on autumn passage from 1. xi. to 29. xi. Two were obtained. Not noted on spring passage.

Locustella luscinioides.

L. l. luscinioides (Savi).

An adult female was shot at Rafa on 26. x. The species was not otherwise noted. There is another bird in the Tring collection from Palestine dated 19. ix.

Locustella fluviatilis.

The River-Warbler was only obtained once, on 30. ix. at Rafa. The specimen is curious in having no trace of the greenish tinge, which is quite distinct in the series both at Tring and in the British Museum. Wing 71 mm.

Acrocephalus arundinaceus.

A. a. zarudnyi Hart.

Scarce on autumn passage at Rafa. First seen on 20. viii. and last on 10. ix., but always singly. Of three obtained, the wings of males measure 95 mm. and that of one female 94 mm. All birds are in full body moult, though the wings are complete.

Not noted on spring passage.

Acrocephalus scirpaceus.

A. s. scirpaceus (Herm.). (=*streperus* Vieill.)

Noted on autumn passage at Rafa from 15. viii. to 7. ix., after which it became scarce, the last being seen on 26. ix.

On spring passage it occurred at Ramleh and in the Wadi Rubin from the second week in March to 27. iii.

Not observed in summer.

Of seven obtained, the wings of five males vary from 64 to 67 mm.

Acrocephalus palustris (Bechst.).

Occasional on passage at Rafa from 15. viii. to 3. ix. As this species could only be identified when it condescended to use its voice, and as it was comparatively silent on passage, possibly many were overlooked, for we failed to discriminate between Reed-Warblers, Marsh-Warblers, and *Hippolais pallida*, unless we heard them call or actually handled them.

Acrocephalus schœnobænus (L.).

First observed on autumn passage at Rafa on 20. viii., when a few were scattered over the desert scrub, looking very lost and tired. They remained till 26. viii., after which none were seen till 6. ix., when one was caught alive and liberated. A few appeared again on 17. ix., and another was caught on 25. ix. No records made of spring passage.

Hippolais pallida.

H. p. elæica (Lindermayer) Isis, 1845 (Greece).

This race is paler and greyer than *H. p. pallida* from Egypt and southern Europe, and is very distinct when seen in a large series.

Very common on autumn passage at Rafa from 13. viii. to 22. x. The spring arrival in southern Palestine was not noted, but the birds bred plentifully round Jaffa, nesting in orange trees, or sometimes in colonies in reeds, seventeen nests being found in the former and five in the latter. A few laid early and had young by 10. v., but most had eggs from 18. v. to 31. v.

Of eight obtained, the wings of four males measured from 65 to 69 mm.

Sylvia hortensis. (= *orphea.*)

S. h. crassirostris Cretzschm.

A few were seen on autumn passage at Rafa from 15. viii. to 7. x., but they were never common. They were also common on Mount Carmel in the latter half of April, but were not found nesting, though they undoubtedly were doing so.

This form is readily distinguished from the western race by the very much whiter under parts.

Sylvia borin (Bodd.). (*Sylvia hortensis* auctorum.)

The Garden-Warbler was first observed on autumn passage at Rafa on 27. viii. and soon became common, birds of the year predominating. It became scarce on 18. ix. and was not seen after 28. ix., except for one on 6. x.

No records made of spring passage.

Sylvia atricapilla.

S. a. atricapilla (L.).

On autumn passage these birds were first seen at Rafa on 3. ix., after which there were always a few in the gardens till 16. ix., when they completely disappeared. On 21. ix. a new influx arrived, mostly females and immature birds; a few were noticed in October, but none in November. A belated female seen on 15. xii.

The spring passage seems to be complete by the last week in March. They were breeding on Mount Carmel in April, when eggs were found.

Sylvia communis.

S. c. communis Lath.

The passage migrants, of which eleven were obtained, were all the western race, but no breeding birds were obtained. The autumn passage commenced at Rafa on 15. viii. and ended on 24. ix., during which period they were common.

Two nests with slightly-incubated eggs were found near Jaffa at the end of May, but this may refer to the eastern race, *icterops*, which certainly breeds in the Jordan Valley if not throughout Palestine.

Sylvia curruca.

S. c. curruca (L.).

The autumn passage at Rafa commenced on 31. viii., and specimens became plentiful from 3. ix. to 30. ix. By 10. x. they were scarce, and were only once seen in November; the last was noted on 15. xii. One was observed near Ramleh on 2. i.

A few were seen in the Jordan Valley in the middle of March. The first spring arrivals at Jaffa appeared on 1. iii., in which locality they bred freely.

S. c. affinis Blyth.

One was obtained on 3. ix. Nicoll informs me this race occurs not uncommonly during spring and autumn in Egypt every year.

Sylvia melanocephala.

S. m. momus (Hemp. & Ehr.).

A few were seen throughout the year in the gardens at Rafa, Khan Yunus, and Gaza. Common in the coastal plains of southern Palestine and in the Shephelah wherever there was suitable bush country. Not observed on the main Judæan ridge. A common resident in the southern parts of the Jordan Valley. It breeds freely on Mount Carmel.

Of fourteen obtained, eleven males have wings varying from 54 to 56 mm., and three females have wings of 54 mm. The ring round the eye is dark brick-red in live birds. Iris bright brown, duller in the immature bird.

They are shy but inquisitive birds. They are bad skulkers in cactus hedges, but will sometimes fly out to a tree, where they become very restive. They invariably, when in bushes, keep close to the ground, and I have never seen one more than three or feet above the ground. In the Shephelah they abound in the bushes, and if the observer keeps still the small white-breasted bird appears like a Jack-in-the-box to have a look round, and as quickly dives back again, to reappear in a minute or so. The white terminal bars to the tail are very noticeable in flight. The alarm note is either a sharp "tick, tick," or a continuous cricket-like sound not unlike that of the Grasshopper Warbler.

Sylvia ruppelli Temm.

Only observed on autumn passage at Rafa from 5. ix. to 20. x., when it was scarce and no adult males were seen. A female was obtained on Mount Carmel on 22. iv.

Agrobates galactotes.

A. g. galactotes (Temm.).

A very plentiful summer visitor to all the gardens in the coastal plain from Rafa north to Carmel. No records from the Judæan highlands or the Jordan Valley, though it may occur in both districts.

Breeding birds usually arrive during the first or second week in April, and lay throughout May and in early June. Towards early August the adults begin to leave, and by the last day of August the whole lot have left.

The nest is placed low down in an orange tree, in a cactus hedge, or often on a stump near a stream. It is a large untidy structure, measuring some 8 inches across, the cup being $2\frac{1}{2}$ inches in diameter. The platform consists of roots, straw, twine, grass and bent-stalks, the cup being lined with cotton-waste, a few feathers, some fine grass, and flower-seeds. Several had a partial horse-hair lining. Clarke notes that out of twenty nests found only three contained snake-skin.

When breeding, the parents display great anxiety, hovering in a very beautiful manner over the nest, diving madly into bushes, and hopping into the open with jerking tail. They are normally the reverse of shy, and utter their lovely song from a topmost branch or telegraph-wire. They often feed in the open, jerking their terra-cotta tails erect with a curious forward flicking of the wings and contraction of the head and neck.

Scotocerca inquieta.

S. i. inquieta (Cretzschm.).

Only seen at one place—in the Judæan hills, about ten miles north of Jerusalem, where one was obtained on 24. x. It does not differ from Egyptian and other Palestine examples which I have examined.

Prinia gracilis.

P. g. palæstinæ Zedl. J. f. O. 1911, pp. 106–110. Palestine and Asia Minor.

In this race the upper parts are browner and paler than in *P. g. deltæ* from the Nile Delta, specimens from Suez appearing to be intermediate. Sladen (Ibis, April 1919) refers this race to *deltæ*, but notices the difference which has given it subspecific rank.

Locally common and resident in the following localities: Lower Jordan Valley and north end of the Dead Sea, the valleys of the Shephelah from Jibrin north at least for twenty miles, in the coastal plain at Askalon, Jaffa, Ramleh, and behind Acre. A few on Mount Carmel.

A nest with three eggs was taken on Mount Carmel on 23. iv., and another with four eggs on 12. v. at Ramleh, both clutches being fresh and of the pink type. The nest is composed of coarse bents and stalks, thickly lined with thistle-down. Outside measurements, 130 mm. deep and 65 mm. diameter; the entrance at the side of the top being 30 mm. in diameter. Young able to fly were observed as early as 27. iii., and young were again found in the nest on 26. vi.

Of seven obtained, the wings of four males vary from 42 to 44 mm.

Cisticola cisticola.

C. c. cisticola (Temm.).

A locally common resident at Amwas (Emmaus), near Jaffa, Ramleh, and Yebna, preferring reeds and generally marsh-land. Sladen took fresh eggs at Yebna on 20. vi. Not seen in the Jordan Valley.

Crateropus squamiceps.

C. s. squamiceps (Cretzschm.).

We only found this bird at the north end of the Dead Sea, on both sides of the Jordan, extending west to Jericho, north to twelve miles from the mouth of the Jordan, and south on the west coast of the Dead Sea for ten miles.

In the Jericho Valley nests were found high up in the fork or on the crown of a thorn tree. Eggs were laid about the middle of April, the clutch being usually five, sometimes seven or even nine. Their colour was an intense pale blue.

Turdus pilaris L.

A winter visitor in small numbers, being obtained as far south as Rafa on 18. xi., before which date it was never seen. Not seen after 27. ii.

Turdus philomelos.

T. p. philomelos Brehm.

The Song-Thrush appeared on autumn passage at Rafa on 29. x., after which date it was fairly common but very wild, many passing further on, but a good many remained during December and January. A very common winter visitor to the Shephelah and coastal plain, it had nearly always gone north by 28. iii., though an odd bird could be seen till the middle of April.

Turdus merula.

T. m. syriaca Hemp. & Ehr.

A fairly common but secretive winter visitor to southern Palestine, the first arrivals—three cocks and two hens—being noted at Rafa on 24. xi., and from that date a few could be usually found in the gardens. Seen at Hebron in the snow on 8. i., and fairly common in the coastal plain during December and February. It left about 11. iii., though one was seen on Mount Carmel on 24. iv. Two adult males obtained have wings of 126 and 130 mm.

Monticola saxatilis (L.).

A pair of adult birds were obtained on the High Lebanon on 1. vii, and really come outside the scope of this paper. Not observed in southern Palestine.

Monticola solitarius.

M. s. solitarius (L.).

A bird of passage in small numbers to southern Palestine, the first autumn arrival at Rafa being noted on 21. ix. It was fairly common in the first week of October, but was not seen after 16. x.

A few also winter in the Shephelah and coastal plain, being obtained on 26. xii. and 7. i.

The four specimens obtained agree with birds from southern Europe and Algeria.

Œnanthe œnanthe.

Œ. œ. œnanthe (L.).

A common bird of passage in southern Palestine on both migrations. In autumn the first arrival appeared at Rafa 6. ix. and proved to be a young cock. Several were seen on 18. ix., after which date they became fairly common till the end of October, the last being seen on 23. xi.

On spring passage at Ramleh the birds were first observed on 14. iii., the passage lasting till 25. iv. On spring passage they are spread over the whole country from the Jordan to the coast.

This species breeds on Hermon, Lebanon, and the higher ground near Galilee.

Of eleven specimens five adult males compare well in colour with birds from continental Europe, but the culmen is slightly longer, ranging from 17 to 19 mm., whereas in most Continental birds the culmen varies from 16 to 17 mm. I do not consider this sufficient to justify the race "*rostrata*," which name I consider should become a synonym of the typical race. *Œ. œ. argentea* Lonnb. is, however, a good race with lighter mantle, more white on the forehead, and longer wing, though not so long as in *Œ. œ. leucorrhoa.*

The wings of five adult males obtained vary from 94 to 98 mm.

Œnanthe deserti.

Œ. d. deserti Temm.

A female shot at Rafa on 17. xi. belongs to the western race. Not otherwise seen.

Œnanthe hispanica.

Œ. h. melanoleuca (Güld.). (=*Sax. hisp. xanthomelæna* Hemp. & Ehr.)

Breeds throughout southern Palestine and northern Sinai, from Mount Carmel south and east to the Jordan Valley. Clutches of five and six eggs were taken on Carmel on 23. iv. and 26. iv. respectively, the former being well-speckled with rusty spots, forming a distinct zone at the base of one egg, whilst the second clutch have fewer and smaller freckles of rust, mostly at the larger end. Clarke found six fresh eggs near Gaza on 4. v., and young were being fed at Belah on 18. vi. In each case the nest was placed under a ledge of rock, and was composed of coarse roots and bents, thickly lined with horse-hair.

In early September birds commenced moving south. They were scarce after 28. ix., the last seen being an adult male on 15. x. In spring they commence arriving in the first ten days of March, and are common by 21. iii.

Of twenty adult males obtained fifteen are black-throated and five are white-throated.

Œnanthe pleschanka.

Œ. p. pleschanka (Lepech.).

An unsexed bird obtained at Rafa on 29. x. Not otherwise seen.

Œnanthe finschii.

Œ. f. finschii Heugl.

The resident Chat of the hills of southern Palestine, being only subject to local movement in winter. It was most plentiful on the hills between Hebron and Beersheba in December. None were seen near Jerusalem, but it was plentiful in the Shephelah in winter and summer.

An adult male, which made G. H. Q. Camp its winter quarters, arrived on 29. x. and remained till certainly late January, not confining his movements to the Camp only, but to a certain small piece of rough ground some half-acre in extent, which he never left.

Œnanthe isabellina Cretzschm.

This species was fairly common round Belah and Rafa from June to August, but no nests were found. The autumn passage commenced on 8. ix. and began to finish about 24. ix. None were observed from 5. x. to 4. xi., but a few were seen from the latter date till early January and possibly later. It is probable that these winter birds come from a different locality to the summer and autumn birds. None were seen in the Judæan highlands, the Shephelah, or coastal plain north of Gaza at any season.

Œnanthe lugens.

Œ. l. lugens Licht.

Apparently confined in southern Palestine to the barest slopes and wildernesses of the Jordan Valley, where it appears to be resident. It usually nests from the middle of March to the end of May, the nest being in a hole or under a ledge of rock and made of fine grasses and roots, lined with a little hair and a few feathers. The normal clutch is five.

Two young birds obtained on 2. iv. are of especial interest.

The male has the crown and nape dull fawn, each feather edged with brown. The back is black, each feather edged with fawn, the whole giving a mottled appearance. The female has the head and nape russet-fawn, and only slightly paler than the back. Both birds are undoubtedly in nestling plumage, and it would therefore appear that this form in its nursery plumage resembles *Œ. l. halophila* of N.W. Africa, in which race the plumage of the adult female differs from that of the adult male, whereas in *Œ. l. lugens* the adult plumage is similar in both sexes.

Œ. l. persica Seeb.

I agree with Sclater and Praed in considering this bird a subspecies of *lugens*.

A specimen obtained in the Jordan Valley on 11. xi. has the top of the head much darker than in typical *lugens*, with a much broader black subterminal tail-bar. The under tail-coverts are, however, not darker than in *Œ. l. lugens*. This specimen, though undoubtedly referable to *persica*, tends towards typical *lugens*.

Saxicola rubetra.

S. r. rubetra (L.).

S. r. spatzi (Erl.).

Of four specimens brought home, one is of the typical western race and was obtained on 9. ix., the other three are of the Dalmatian form, the breeding range of which probably extends much further east than its typical locality.

Nicoll informs me that both forms occur on passage in Egypt.

Whinchats are only birds of passage in southern Palestine, arriving in autumn on 8. ix., becoming common about 15. ix., and again scarce on 29. ix. Last seen on 30. x.

The only record of the spring passage is of one specimen (*spatzi*) obtained at Rafa on 1. v.

Saxicola torquata.

S. t. rubicola (L.).

A common winter visitor. At Rafa the autumn migration commenced on 21. x., when a single adult female appeared, after which a few females and birds of the year appeared. Their numbers increased about 23. xi., when they became very common, adult males being the last to arrive. They were plentiful throughout the winter in the coastal plain, the Shephelah, the Judæan highlands, and the Jordan Valley.

They commenced moving north in the first few days of February, and except for one seen on 26. iii. they had all gone by 21. iii. It was noticed that in winter birds were in pairs, though the southern migration appears to be separately undertaken.

Of the six specimens brought home, none have any white at the base of the tail, and in the two males the upper tail-coverts are flecked with black. The wings of two males measure 66 and 67 mm., and those of four females from 63 to 66 mm.

Phœnicurus phœnicurus.

P. p. phœnicurus (L.).

Common on autumn passage in southern Palestine, where perhaps a few remain for the winter. At Rafa the first to appear was an adult male on 12. ix. The birds became fairly common by 19. ix., and were plentiful from 23. x. to the end of the month. They were scarce throughout November and very few were seen in December. No record was made of the spring passage.

P. p. mesoleuca (H. & E.).

One example of this race was obtained on 1. ix. at Khan Yunus. Not otherwise observed.

Phœnicurus ochruros.

P. o. gibraltariensis (Gm.).

A fairly common winter visitor to southern Palestine, the first—an adult male—being seen at Rafa on 9. xi., but the majority were confined to the Judæan highlands, where I saw many, on 7. i. at Hebron, sitting disconsolate on stone walls, but looking beautiful against a snow-clad country. The food of this bird was, as far as I could judge, almost confined to a small black ant.

Cercomela melanura.

C. m. melanura (Temm.).

Confined to and resident in the Jordan Basin, but does not descend to the actual bottom of the valley. Of nine obtained at and near Jericho the wings of three males vary from 75 to 82 mm., and those of five females from 74 to 82 mm. Half-fledged young were found on 2. iv.

Luscinia luscinia (L.).

The Sprosser was observed on autumn passage at Rafa from 20. viii. to 8. x., the bulk passing from 8. ix. to 15. ix.

On spring passage it was obtained on Mount Carmel on 13. iv. and 16. iv.

Luscinia svecica.

L. s. volgæ (Kleinschm.).

The only two examples we brought home belong to this race.

Bluethroats began to appear on autumn passage at Rafa on 18. x., when an adult male was shot, and from that date onwards a few could always be found till 7. xi., when they all disappeared. Some new arrivals appeared on 25. xi. but passed on at once.

I saw one in the Shephelah on 1. i., and Sladen obtained birds (sub nom. *L. s. svecica*) near Jaffa on 28. i. and 28. iii., so it is probable that a few winter in southern Palestine, and it is possible that these winter birds are the typical race, whilst the passage migrant is *volgæ*. Both forms occur commonly in Egypt in winter.

Prunella modularis.

P. m. modularis (L.).

An adult male was obtained at Ramleh in southern Palestine on 19. xi. Wing 69 mm. Second primary equals the seventh. Two others were seen on 22. xi. Tristram describes this species as a scarce resident in the Lebanon, and it is possibly the hill birds which wander down to the plains and lower ground in cold weather.

In comparing our Palestine specimen with a large series of *P. m. modularis*, *occidentalis*, and *orientalis*, I was unable to discriminate between the shade of colour said to distinguish the three races one from the other. Rumanian and other Continental specimens agree perfectly with British, whilst I could detect no possible difference between *P. m. modularis* and *P. m. orientalis*.

Now in *P. m. modularis* the second primary is always said to be longer than the seventh, in *occidentalis* it is never longer than the seventh, and in *orientalis* it about equals the seventh. I find these formulæ to be only the case among the majority and do not hold good in a large series, and I can produce both British and Continental birds with second primaries equal to the seventh. I therefore prefer to unite both *orientalis* and *occidentalis* with the typical Continental race, as I doubt if subspecific value is of much use, and may be misleading, where in a large series one cannot distinguish the different races.

Erithacus rubecula.

E. r. rubecula (L.).

A common winter visitor to southern Palestine, whilst many are birds of passage. First arrival at Rafa was noted on 3. xi., after which date they became generally distributed until by the end of November they were abundant both in the plains and on the Judæan highlands, where I was delighted to see one on Christmas Day in the Temple area in Jerusalem, and another in the snow at Hebron on 7. i. A few were seen at the north end of the Dead Sea in November.

On spring passage they were noted from 6. iii. to 21. iii.

The two examples brought home agree with Continental specimens.

Chelidon rustica.

C. r. rustica (L.).

Only noted on passage in spring and autumn. At Rafa large flocks passed from 5. viii. to 14. viii. and again from 1. ix. to 7. ix., all travelling parallel with the coast and heading for Egypt, the last parties containing many *C. r. transitiva*. From 1. x. to 15. x. this race far outnumbered *transitiva* on passage, and only a few were seen after 27. x. None seen after 30. x.

The spring passage at Ramleh lasted from 16. iii. to 8. iv.

C. r. transitiva Hart.

Nowhere common as a resident. Breeds at Rafa, Khan Yunus, Belah, and on the desert between Rafa and Beersheba, using wells or underground cisterns, one nest with four eggs being found in a cistern within two feet of a Little Owl's nest with two eggs. Breeds sparingly throughout the coastal plain and Judæan highlands, and last year's nests were seen in Beersheba.

I was much surprised to find this bird passing south-west at Rafa in considerable flocks from 22. ix. to 28. x., there having been a large gathering of young birds about Khan Yunus since 23. viii. In late November and early December large numbers of birds arrived for the winter in the plains of southern Palestine which seemed intermediate between *H. r. rustica* and *transitiva*.

On spring passage at Ramleh large flocks were seen passing north from 31.iii. to 6.iv., while a few were seen on passage on Mount Carmel on 22. iv.

Tristram states that this race does not occur north of the Lebanon. Where, then, do all these passage migrants come from? And where do they go? It will probably be found that they spread out all over Syria in summer and occur throughout Arabia and N.E. Africa in winter. Their southern breeding range probably also extends south of Palestine, for one was shot in Sinai on 13. iv. (Auk, July 1915).

It may be interesting to note that *C. r. savignii* breeds on the east bank of the Suez Canal, where I found two nests at Kantara in May.

This very distinct geographical race is intermediate between *C. r. rustica* and *savignii*, but appears to merge into *C. r. rustica* on its northern limits and in Cyprus. The young bird in nestling plumage is very pale and whitish on the under parts, and I could only detect traces of the true "*transitiva*" colour. In the same way the nestling plumage of *savignii* is usually much paler than in adults, and closely resembles the true "*transitiva*" shade of red.

Chelidon daurica.

C. d. rufula.

Observed breeding on Mount Carmel, round Lake Galilee, and at Jerusalem and Jericho. Fresh eggs were taken on Mount Carmel on 23. iv. from the usual type of nest situated in a cave. Total length of nest 12 inches, length of neck 4 inches, outside diameter of neck $2\frac{1}{2}$ inches, diameter of nest $3\frac{3}{4}$ inches, inside diameter of mouth under 2 inches.

The fresh egg is very pale pink, which soon turns to white after being blown. None had any markings.

Four specimens were obtained on Mount Carmel on 27. iv., the wings of three males varying from 118 to 120 mm.

This bird is only a summer visitor to Palestine.

Hirundo urbica.

H. u. urbica (L.).

A few were observed on passage on Mount Carmel on 23. iv. The wings of two males obtained measure 108 and 109 mm. Not otherwise seen.

Riparia riparia.

R. r. riparia (L.).

R. r. diluta (Sharpe & Wyatt).

Only two Sand-Martins were brought home, one of the typical race shot at Ramleh on 23. iii. when on spring passage, and another which I refer to *R. r. diluta* shot at Shellal on 23. ix. when they were plentiful on autumn passage. The latter specimen compares well with birds from the Lena River, and the bird of the typical race agrees well with British specimens though it is rather on the dark side.

Sand-Martins, which I believe belonged to the Siberian race, were first seen at Rafa on autumn passage on 27. viii. and again on 2. ix. Several were observed from 17. ix. to 8. x., but none after 14. x.

Apus apus.

A. a. apus (L.).

One was obtained on autumn passage at Belah on 30. vii., where on that and the following day several flocks passed south-west. No other Swifts were observed on autumn passage.

A. a. marwitzi Reichen.

I refer a bird shot on Mount Carmel on 13. iv. to this race. Wing 175 mm. It is both paler and browner on the head than typical specimens, but not quite so pale as typical *pekinensis*. The bird agrees best with *marwitzi* from the Caucasus and Asia Minor as regards its head and forehead, but the chin is pure white.

Swifts of some sort commenced their northward passage in southern Palestine on 16. ii., though some were seen at Jericho on 12. iii. and 15. iii., but it is not certain whether the latter were not winter visitors or even residents. The northward passage in the coastal area increased towards the end of March, and continued to diminish throughout April, the last passage migrant being seen on 5. v.

Swifts bred at Ramleh, Jaffa, and Jerusalem.

Apus melba.

A. m. melba (L.).

Two were obtained at Shellal from a party on passage on 23. ix., and one on 4. x. at Rafa. These three specimens are all females with wings measuring from 191 to 202 mm. Their small size and the very much paler tint of the upper parts is remarkable ; I can find nothing like them in either the British or Tring Museums.

The Alpine Swift is a summer visitor to southern Palestine, arriving at the end of February and leaving from the end of September to early October. It breeds in the Mosque of Omar at Jerusalem, in the wilder ravines of the Jordan Valley, and possibly on Mount Carmel, where birds were seen on 22. iv.

Caprimulgus europæus.

C. e. sarudnyi Hart.

A pair were obtained at Rafa on 18. ix. and 19. ix. when resting on autumn passage. The colour of both birds is nearest that of *unwini*, but in the male the white spot on the first primary does not reach to the shaft, on the second primary it is confined to the inner web, whilst on the third primary it extends to both webs but is only 10 mm. wide on the shaft. Wing of male 186 mm., and of the female 173 mm.

Nightjars first appeared on passage at Rafa on 16. viii., and were occasionally seen till 30. x., but were never common. It is probable that they breed sparingly in southern Palestine, as birds were seen at Ramleh on 7. v. and on Mount Carmel on 23. iv.

Merops apiaster L.

An abundant but local breeding species from the Wadi Gaza north at least to Jaffa. Not observed nesting either in the Judæan highlands or in the Jordan Valley. Fresh eggs were taken at Jaffa on 20. v., birds having commenced to build on 20. iv. Young in the nest on 26. vi., and others were fully fledged by 27. vi.

The birds which bred near Gaza flocked at the end of July, both old and young travelling together, while all had left by 2. viii. After these breeding birds had passed, large flocks appeared on 28. viii. passing south-west, and this passage was almost continuous till 15. ix., when it abruptly ceased, and no more were seen except one large flock which passed over Rafa on 22. ix. travelling south-west at a great height.

The first spring migrants were noted at Ramleh on 3. iv., and flocks were passing north all day on 4. iv. This passage continued without interruption till 9. iv., after which it diminished, but a considerable movement was noted on Mount Carmel for four days from 20. iv. The breeding birds seemed to arrive with the first few flocks of passage migrants.

Merops persicus.

M. p. persicus Pall.

One was shot at Ramleh on 3. iv. when on passage. It breeds in banks in the Jordan Valley according to Clarke, and Tristram found a large colony in northern Syria at Jerablus on the Euphrates.

Upupa epops.

U. e. epops L.

Obtained 17. viii., 21. ix., and two on 14. iii. There is a very marked difference in the pale worn plumage of the bird shot on 17. viii., which is vinaceous isabelline, and the rich vinaceous brown of the freshly-moulted bird shot on 21. ix.

Hoopoes doubtless breed in Palestine, but we saw no sign of them. Autumn passage at Rafa commenced on 27. vii., when a few single birds appeared in the gardens. By 27. ix. they were fairly plentiful, and while at sea off Gaza I saw three single birds approaching the shore from the north and flying not more than a foot or so above the water. They became scarce after 1. x., and the latest record was on 13. x.

On spring passage at Rafa, they appeared on 2. iv. and continued passing till 10. iv. Two years later the spring passage at Ramleh commenced on 23. ii. and lasted till 5. iv. Several birds were seen in the Jordan Valley in the middle of March, but none anywhere in summer.

Coracias garrulus.

Two birds of the year were obtained on 30. viii. and 4. ix. The male has a wing of 195 mm. and the female 189 mm. The adult plumage beginning to show on the upper parts more closely resembles that of *semenowi* the eastern race, but the length of wing is nearer that of the typical western race. I therefore hesitate to refer them to either form pending more material from Palestine.

Rollers were not found breeding in southern Palestine, though one was seen at Belah on 12. vi.

The autumn migration commenced very early at Rafa, the first birds being seen on 31. vii., when four passed. From that date their numbers gradually increased till late August, when they were very common everywhere, as many as twenty-three being seen sitting in a thorn tree in the desert. After 17. ix. the numbers gradually decreased, the last being seen on 24. ix. In the following year three belated birds were seen at Jerusalem on 20. xi., but this is exceptional.

The spring passage in southern Palestine commenced on 24. iv. and continued till 12. v., the bulk in flocks of from forty to seventy passing about 28. iv.

Ceryle rudis.

C. r. rudis (L.).

Common at the south end of the Jordan Valley in November, and a common resident at Jaffa and Haifa. None were obtained.

Alcedo atthis L. 1758 (Egypt). (= *A. ispida* L.)

A. a. atthis L. (= *A. ispida pallida* Brehm.)

A common bird of passage through southern Palestine and a winter visitor to the coast, being seldom seen more than five miles inland, though one was seen at the north end of the Dead Sea in early November. The autumn passage commenced at Rafa on 1. viii., when quantities were seen on the sea-coast resting on rocks and passing west towards Egypt. By 15. viii. they were abundant on the coast from Gaza to El Arish, their numbers diminishing throughout September. Very few were seen either at Jaffa or Gaza in winter. No records were made of the spring passage and departure of winter visitors.

Halcyon smyrnensis.

H. s. smyrnensis (L.).

Not uncommon at the south end of the Jordan Valley, where it is resident. A few occur on the coast throughout the year, especially round Jaffa, only straggling as far as Belah in winter.

Dryobates syriacus.

D. s. syriacus (Hemp. & Ehr.).

A few pairs are resident in most clumps of trees in the Judæan highlands and in the Shephelah. It was also observed near Lake Galilee in April. A female shot on 30. xii. had a wing-measurement of 129 mm.

Jynx torquilla.

J. t. torquilla L.

Four specimens were brought home, three autumn birds and one shot on 7. iii. They are all markedly grey on the upper parts, but can be matched by autumn birds from Algeria, Germany, and England. An examination of eastern Asiatic specimens (*japonica*) makes me doubt whether they can be separated from the typical European Wryneck. They are not always smaller, the wings of many ranging to 90 mm., and the plumage, so variable individually in this species, is scarcely distinguishable, while in most birds from the mouth of the Amur the plumage is identical with European birds.

The paleness of all the Palestine birds does, however, make me wonder whether central Asiatic Wrynecks may not be more liable to this pale phase than European or eastern Asiatic birds.

Common on both passages. First observed at Rafa in autumn on 2. ix., after which a few tired individuals could be found sitting disconsolate in gardens. Not seen after 18. ix., except once, on 25. x. Spring passage commenced at Ramleh on 6. iii. and lasted till 27. iii., when the bird was by no means rare.

Cuculus canorus.

C. c. telephonus Heine.

The five specimens brought home agree with this race as regards the lighter grey of the throat, but the barring on the under parts, though scarcely so narrow as in *telephonus*, is not so broad as in most specimens from western Europe, yet it compares well with some of them. The barring on the under tail-coverts is, however, much narrower than in *C. c. canorus*, and agrees well with Himalayan specimens of *telephonus*.

A common bird of passage in southern Palestine, first seen in the autumn at Belah on 8. vii., and becoming common by 28. vii. It was scarce by 30. viii., the last seen being on 14. ix. All the Cuckoos observed and obtained were adults, except for four immature examples seen in the last few days of August.

The spring passage at Ramleh commenced on 13. iii. and continued till 24. iv., fewer birds being seen than in the previous autumn. It was not observed in summer, though Tristram describes it as a summer visitor, especially to the Jordan Valley. We never visited that valley in summer, and it will be interesting to know which is the breeding race of Palestine.

Clamator glandarius (L.).

We did not observe this species, though it is undoubtedly a regular summer visitor to Palestine, arriving from early March. Sladen (Ibis, April 1919) saw one first at Jaffa on 25. iii.

Otus scops (L.).

One was wounded on 19. ix. near Jaffa, but we failed to secure it. Not otherwise seen.

Athene noctua.

A. n. glaux (Sav.).
A. n. lilith Hart.

Of the six Little Owls brought home, four from Rafa are referable to *lilith* and two from Ramleh to *glaux*.

The Rafa specimens agree with *lilith* from North Syria and others from Palestine in the Tring Museum, but the two shot at Ramleh on 20. iii. and 19. xii. are identical with *glaux* from Egypt. I also saw typical *lilith* and typical *glaux* nesting together near Gaza and Beersheba, whilst intermediate birds were common. It would therefore appear that a broad belt of country bounded on the north by a line Jaffa-Jerusalem and in the south by a line Gaza-Beersheba, is inhabited by a Little Owl, some of which are typical *glaux*, others typical *lilith*, and others intermediate in colour. There is one of the intermediate birds in the Tring collection, labelled "Jerusalem, in summer."

Little Owls are plentiful residents throughout the country, both in the desert country, in villages, and gardens. Their usual nesting sites are down a well, in an underground cistern, or, in the Shephelah, among boulders.

Asio flammeus Pontopp. (*Asio accipitrinus* (Pall.))

Four were seen on passage on the desert near Rafa on 2. xii. Sladen obtained one at Yebna on 10. i.

Tyto alba. (*Strix flammea* auctorum.)

T. a. alba (Scop.).

From late October to early December there was a considerable movement of these birds near Rafa and Gaza. The earliest record was on 1. x., when one was picked up dead near the coast at Rafa, and many were caught by our troops in the trenches opposite Gaza in late October and early December. The latest record is on 4. xii.

A male picked up on 1. x. has a wing measuring 284 mm. Lower parts and legs pure white, except for a slight yellow tinge on the upper breast, every feather having a narrow shaft-stripe on the middle part only of the shaft, and a small drop-shaped brown fleck at the tip. The only other Palestine specimen I have examined is very similar, but with fewer markings on the under parts.

Falco peregrinus.

F. p. pelegrinoides Temm. (*F. barbarus* auct.)

An adult male shot at Shellal on 3. xii. was the only record. Wing 279 mm.

Falco biarmicus.

F. b. tanypterus Schleg.

Fairly common on autumn passage in southern Palestine from Gaza to Beersheba, being first observed on 27. viii., after which date it became fairly common, small lots of five being often seen together. Towards the end of November it became scarce. Observed near Jaffa and in the Shephelah in late December.

On one occasion a female was seen to stoop at and knock feathers out of a Hobby.

Two males obtained at Rafa have wings measuring 312 and 334 mm.

Falco subbuteo.

F. s. subbuteo L.

Fairly common on autumn passage at Rafa, being first observed on 1. x., when it was common for about ten days and then disappeared. Single birds were seen on 23. x., 6. xi., and 23. xi. Not noted elsewhere.

An immature female obtained at Rafa on 1. x. has a wing of 248 mm.

Falco columbarius.

F. c. regulus Pall.

First seen at Rafa on autumn passage on 2. xi., after which it was noticed daily till early January, but the numbers decreased at the end of November. Several were seen in the coastal plain north of Gaza and in the Shephelah in late December.

A pair obtained compare well with birds from England. Wings of male and female 190 mm.

Falco tinnunculus.

F. t. tinnunculus L.

The autumn passage commenced at Rafa on 28. ix., when several large parties appeared and passed on. Another influx occurred for the three days following 27. x., when parties could be seen hawking insects at about 300 feet. The crops of those killed contained lizards, spiders (*Galleodes*), and flying ants.

F. t. rupicolæformis Brehm.

This is the breeding race all round Gaza and Rafa, the darker and richer upper parts easily distinguishing it from the typical migratory form. Males with wings of 243 and 246 mm. were obtained at Rafa on 25. vii. and 28. ix.

Kestrels were breeding near Jericho in the middle of March and near Acre, but no specimens were obtained. It will be interesting to know how far into Palestine the Egyptian race extends.

Aquila heliaca.

A. h. heliaca Sav.

The Imperial Eagle is a sparse resident round Gaza and Rafa, but from its conspicuous size is noted nearly daily on the desert.

Hieraëtus pennatus (Gm.).

A female Booted Eagle with white under parts was killed near Ramleh on 3. i. Wing 381 mm. Another, now in the Cairo Zoological Gardens, was obtained at the same place.

Buteo ferox.

B. f. cirtensis (Lev.).

An immature male was obtained on 14. ix. at Rafa and an adult female at Shellal on 10. ix. Wings 366 and 393 mm. respectively. These specimens have been compared with a large series from North-west Africa, and there is no doubt that this race extends at any rate to southern Palestine as a migrant.

None were noticed in summer. First seen at Rafa on 8. ix., and after 24. ix. large numbers arrived. About 8. xi. a further influx arrived, and as many as twenty could be seen sitting together roosting in the early mornings. There was a marked decrease about mid-December, but near Gaza on 18. xii. the telegraph-lines were thick with them, as many as forty-five being counted in a mile.

Dead animals were invariably refused by this bird, whose diet consisted of rats, lizards, etc.

The flight is graceful but heavy, and its peculiar markings on the upper and under surface of the wing, which, when in flight, looks as though a white circular patch has been painted there, gave it the local name of the Aeroplane Bird among the troops. Individuals varied much in colour, some being dark throughout and others having an almost white head with cream-coloured body and tail. It is more than likely that if a large series had been collected, not only this race but *Buteo ferox ferox* as well as *Buteo b. zimmermannæ* and *rufiventer* (*desertorum*), would have been obtained, as they must pass this way on their autumn passage.

Circus æruginosus.

C. æ. æruginosus (L.).

An adult female was obtained near Ramleh on 28. x. Wing 406 mm. The autumn passage at Rafa commenced on 21. xi., when a few arrived, both young and adults being seen. A bird noticed at Gaza on 25. xi. had an almost pure white crown and nape, with apparently no trace of cream-colour.

Sladen states that this species breeds near Yebna, which would seem to be the case, as Tristram observed it in Palestine throughout the year.

Circus macrourus (Gm.).

An adult male and female were obtained at Rafa on 29. x. and 17. ix., with wings measuring 332 and 364 mm. respectively.

Only observed on autumn passage at Rafa from 9. ix. to early November, when it was not common. A few reappeared at Rafa and in the coastal plain north of Gaza in December and January.

Accipiter nisus.

A. n. nisus (L.).

Only observed as a winter visitor to the Lower Jordan Valley, where it was not rare. A female obtained on 10. xi.

has a wing measuring 240 mm., and compares well with other typical examples from Asia Minor.

Milvus milvus.

M. m. milvus (L.).

The Red Kite appeared about Rafa in small numbers on 26. x., after which a few were seen in the coastal plain and in the Judæan highlands, but they were not seen in any numbers except at Hebron in December. They were more shy than *Milvus migrans.*

Milvus migrans.

M. m. migrans (Bodd.).

The Black Kite is a plentiful resident throughout southern Palestine, and was breeding in palm trees at Belah in June. A large influx arrived at Rafa on 27. ix. and remained till 15. x., after which the numbers became normal.

It appears that *M. m. ægyptius* occasionally occurs in northern Sinai, for we frequently saw birds which we took for this race. Tristram records them as the Kite of the Jordan Valley and *M. m. migrans* as a summer visitor to Palestine.

Circaëtus gallicus (Gm.).

One shot at Rafa on 22. viii. was the only specimen identified for certain. Its crop contained two chameleons. Wing 504 mm.

Gyps fulvus.

G. f. fulvus (Habl.).

A few were seen in June and July round Gaza and on the desert towards Beersheba. A party of twenty-four were noted at Beersheba on a dead camel on 3. xii. None were obtained.

Neophron percnopterus.

N. p. percnopterus (L.).

A summer visitor in scattered pairs round Rafa, Gaza, and in the coastal plain, arriving in early March and leaving at the end of October. A party of thirty seen at Ramleh on 16. x. were on passage. An adult female shot on 7. iii. at Ramleh had a wing measuring 519 mm.

On 3. ix. at Rafa an adult bird soaring at about 2000 feet was mistaken by our anti-aircraft batteries for an enemy aircraft, his white under sides glistening in the morning sun, and making him look just like an aeroplane at about 15,000 feet. It was not till he flapped his wings in response to a rather too-close shell that the error was discovered.

Ciconia ciconia.

C. c. ciconia (L.).

Common on spring passage, but not seen in anything like the same numbers in autumn.

The earliest record in spring is on 4. ii., when many hundreds were seen at Yebna; again on 8. iii. a few passed north, but the main movement did not commence till 15. iii., when about two thousand appeared near Gaza in 1917, and passage was continuous till about 30. iii. Many were seen at Jericho on 2. iv. and at Samakh at the south end of Galilee on 24. iv. After this only belated parties were noted till 3. v., on which date Sladen found many birds dead on the Wadi Gaza. This seems a disaster not uncommon to the White Stork which passes north too late or travels south too early (*cf.* Novitates Zool., Feb. 13, where large flocks, half-dead from thirst, descended in the Sahara). Occasional flocks were seen as late as early June.

The only records of autumn passage are of a few small parties seen flying west along the coast near Rafa on 28. vii., a few at Beersheba on 4. ix. and 13. xi., and some at Ramleh on 19. x. No main passage was observed.

We found no evidence of breeding, though Tristram asserts a few remain to nest.

Platalea leucorodia (L.).

None were obtained. Single birds or pairs were seen near Gaza from 28. iv. to 11. v., and from 26. xi. to 29. xi.

Plegadis falcinellus.

P. f. falcinellus (L.).

A female was obtained in Central Palestine on 22. iv. Not otherwise seen.

Ardea cinerea.

A. c. cinerea L.

A few were seen near Belah in early June and near Carmel on 26. iv. These Herons feed largely on the desert and far from water, probing for lizards and mice. I have noted the same habit in Baluchistan.

A slight autumnal movement was noted on the coast near Rafa from 24. viii. to 14. x.

One was seen near Gaza on 13. xi.

Ardea purpurea L.

None were obtained. Occasional at Belah from 11. v. to 30. vi. A party of thirty was seen in the Wadi Rubin on 14. x.

Egretta alba (L.).

None were obtained. Single birds were seen at Belah from 2. vi. to 14. viii.

Bubulcus ibis (L.).

None were obtained. Occasional in suitable country near the coast in May and June.

Ardeola ralloides (Scop.).

Not uncommon in suitable places from 21. iii. to 2. vi. One was obtained on 13. x. in the Wadi Rubin.

Nycticorax nycticorax.

N. n. nycticorax (L.).

An adult male was obtained at Shellal on 18. ix. Wing 300 mm. Others were seen in the coastal plain on 16. iii., and again from 26. viii. to 27. xi.

Ixobrychus minutus (L.).

Not obtained. Eleven birds were found resting in a desert garden on 4. ix. On being disturbed they made off in a southerly direction loudly protesting, and ascending to some 2000 feet before deciding on their direction.

They were plentiful in the Brook Kishon in January and February and near Ramleh in May.

Botaurus stellaris.

B. s. stellaris (L.).

None preserved, but several shot. Observed near Belah on 11. v. and 14. v., while a few could always be found in suitable reeds on the coastal plain in winter. Sladen found evidence of possible breeding.

Phœnicopterus ruber.

P. r. antiquorum Temm.

A few single birds and small parties were seen near the coast from May to September.

Tadorna tadorna (L.).

A pair was seen at the mouth of the Wadi Gaza on 7. vi. No other record.

Anas platyrhyncha.

A. p. platyrhyncha L.

A scarce winter visitor, only seen near the coast in November and December.

Anas crecca.

A. c. crecca (L.).

Common in suitable localities in the coastal plain, the earliest arrival being a young drake on 10. ix.

Anas querquedula L.

The Garganey was fairly common on spring passage in the coastal area from early April to 3. v. Obtained on autumn passage on 7. viii., when it was scarce.

Anas penelope L.

Scarce. Three were seen near Gaza on 13. xi., and small parties throughout December on the Wadi Gaza.

Anas acuta.

A. a. acuta L.

A not uncommon winter visitor to the coastal plain, being seen from 27. x. to 11. v.

Spatula clypeata (L.).

A common winter visitor to the coastal plain and the Jordan Valley, where eleven were seen at the north end of the Dead Sea in early November. The first arrivals on the coast were a pair of adults on 10. x. at the mouth of the Wadi Gaza, the cock being in almost full eclipse. The last seen was on 15. v.

Nyroca ferina.

N. f. ferina (L.).

A party of thirty was seen on the Julie Marshes on 16. iii. Not otherwise observed.

Nyroca fuligula L.

A female was obtained at Gaza on 7. vii. Others were seen in December and March.

Bucephala clangula.

B. c. clangula (L.).

A young drake was obtained at Shellal on 25. xi., and Sladen secured a female at Yebna on 20. i. Not otherwise seen.

Podiceps cristatus.

P. c. cristatus (L.).

An adult female in breeding-plumage was shot on Lake Galilee on 19. ii. These birds do not, according to Tristram, breed there, but probably do so on Lake Huleh.

Columba livia.

C. l. palæstinæ Zedl.

A common resident in the Shephelah and in the Jordan Valley. All birds seen had an entirely grey lower back. They invariably breed either in a disused well or in a cave.

Columba œnas.

C. œ. œnas L.

An abundant winter visitor to the southern parts of southern Palestine, watering in thousands in the Wadi Gaza from November to January. The first arrivals appeared in small parties of four to twenty on 21. x. and caused considerable excitement among the troops, who suspected Turkish Carrier Pigeons. By 2. xi. their numbers had reached their height. Observed passing north at Ramleh on 2. iii. in flocks of three to fonr hundred. A female shot on 3. xii. has a wing of 214 mm. and agrees well with British specimens.

Streptopelia turtur.

S. t. turtur (L.).

A common summer visitor and bird of passage in southern Palestine, the first nest being found at Ramleh on 11. v. It appears to arrive from the end of April, and continues passing north till the middle of May.

The autumn passage commenced at Rafa on 28. viii., and the birds were plentiful on 6. ix. and throughout September. After 10. x. they were scarce, the last being seen on 18. x.

Three autumn examples brought home are of the typical race and not *arenicola*. No breeding birds were obtained, and it is probable they will be found to be *arenicola*.

Streptopelia decaocto.

S. d. decaocto (Friv.).

A common resident north of the line Gaza-Hebron. It also appears to be an abundant winter visitor to southern Palestine, for large flocks passed north at Ramleh from 19. iii. to 29. iv. None were seen in the Judæan highlands in winter, but it is common at that season in the Jordan Valley.

In the Jordan Valley it breeds from the last few days of April, making a typical nest either on the ground or in a very low bush, but never more than a few inches from the ground.

Pterocles orientalis (L.). (= *arenarius.*)

Several small parties watered regularly in the Wadi Gaza at Shellal and near Beersheba during August and early September, but they had all gone by 17. ix. A few returned from 27. ix. to 30. ix.

Pterocles alchata.

P. a. caudacutus (Gm.).

Scarce. A few were seen near Shellal on 4. vi. and in early August. They were watering in large numbers near Beersheba in late September. An occasional pack watered at intervals of some days at Shellal during November and December. On 14. xi. a solitary bird was shot from a flock of Ringed Plover. Its more rapid flight and clumsier movements completely upset the wheeling of the Plovers, and its determination to fly in the centre of the flock caused them much embarrassment. It was in full change from immature to adult plumage.

A cock shot at Shellal on 20. viii. is very light-coloured on the chest, but can be matched by specimens from Tunis and from Lenkoran on the Caspian. It is remarkable that both the darkest and lightest birds in the Tring collection are from Lenkoran.

Pterocles senegallus (L.).

The common Sand-Grouse of southern Palestine and probably resident, as it was there from June to December, watering in hundreds near Shellal in the evening only. After the first heavy rain in the middle of December it watered on surface pools in the desert.

Five specimens obtained agree with birds from Algeria and the Nile Valley.

Alectoris græca.

A. g. sinaica (Bp.).

Four birds from the Shephelah and the Jordan Valley near Jericho are similar. They compare well with birds examined from Engedi on the west shore of the Dead Sea and from the Judæan hills south of Jerusalem. We can therefore assume that the same subspecies inhabits the Lower Jordan and Dead Sea depressions, the Judæan highlands, and the Shephelah.

They agree, so far as one is able to judge, with the original description of *sinaica* (J. f. O. 1858, p. 31), which Dawydoff states occurs also in western Palestine, but he seems to refer the bird from the Ghor or Jordan and Dead Sea depression to *margaritæ*, which he says has a pure grey crown. Now the only Chukar which has anything approaching a pure grey crown is *weræ* from southern Persia, and the Palestine birds are certainly not *weræ*, with which I have compared my specimens. It is also clear that the birds from the Dead Sea and Jordan Valley have not the pure grey crown which Dawydoff assigns to them: we must therefore assume that his expression "pure grey crown" is a natural exaggeration for a bird which has a predominance of grey on the crown. Palestine birds are also much darker in every respect than *weræ*. I am therefore of the opinion that *margaritæ* is synonymous with *sinaica*, the latter race extending from southern Sinai to the Dead Sea and southern Palestine. Birds from southern Sinai are referred to *sinaica* by Zedlitz (J. f. O. 1912), the males having wings measuring 155–156 mm., and the females 147–155 mm. Our Palestine birds run larger, four males having wings of 160, 167, 171, and 172 mm. Two males in the Tring collection from Engedi on the Dead Sea and from the Judæan highlands have wings measuring 158 mm.

A bird from Mount Carmel is darker than southern Palestine birds, and is probably a new race, but only one female with a wing of 158 mm. was brought home. It has no trace of grey on the head.

The Chukar is common in the Judæan hills and the Shephelah, ranging south to near Beersheba and east to the lowest levels of the Dead Sea and Lower Jordan depression. Eggs were found in the Jordan foot-hills on 5. iii., the clutch being seven. Fully-grown young were seen in the Judæan hills on 3. vii.

On Mount Carmel there were about seven breeding pairs in April 1919.

Ammoperdix heyi.

A. h. heyi (Temm.).

Not seen outside the Jordan depression, where it is not uncommon near Jericho, and in the Wadis Auja and Kelt.

The wings of four males obtained measure 122, 123, 125, and 129 mm., while the wing of one female measures 122 mm. They do not agree with the birds from Egypt.

Francolinus francolinus.

F. f. francolinus (L.).

An adult male obtained near Jericho on 16. x. agrees with specimens from the Upper Euphrates and Asia Minor. Wing 180 mm.

Not seen out of the Jordan Valley, where it is plentiful at the junction of the Wadi Zimrin with the Jordan.

Coturnix coturnix.

C. c. coturnix (L.).

Abundant on both passages, a few remaining for the winter. On autumn passage on the north coast of Sinai, between El Arish and Rafa, the first arrivals appeared on 18. viii. in small parties. By 30. viii. the passage had increased, and three hundred and eighty birds were netted at El Arish in a morning. During the first week of September the passage reached its zenith, and over eleven thousand birds were netted at El Arish. At Belah during the first seventeen days of September, never less than three hundred and forty-nine or more than five hundred and sixty-eight birds were taken daily in a single net, but on 18. ix., after a strong north-westerly gale, only forty were taken. On 19. ix. only eight birds were comprised in the catch, and the passage ceased on 20. ix.

They arrived from the north in the very early hours of the morning, and the passage was always completed by 9 A.M., birds usually settling at once, or only flying a very short distance inland. Their flight both over the sea and over the desert seldom reached more than ten to twenty feet above ground or water-level. Migration parties varied from twelve to thirty, being usually about fifteen. Only exhausted birds remained near the coast, the bulk resuming their journey on the following evening.

Odd birds were seen in the coastal plain of southern Palestine throughout the winter.

Spring passage was noted at Ramleh from 12.iii. to 6.iv., but the passage was not so marked as in autumn. The Quail passes north through Damascus in spring in thousands.

Pelecanus onocrotalus.

P. o. onocrotalus L.

A flock of forty-three was observed passing west at Rafa on 22.ix. Observed on spring passage at Belah on 20.iv. and 28.v. in flocks of one hundred and twenty and of five, and at Ramleh on 7.iv. in a flock of one hundred and fifty.

Megalornis grus.

M. g. grus (L.).

Several small parties were seen near Rafa and Beersheba from 10.xi. to 7.i. Observed on spring passage at Ramleh on 20.iii.

Anthropoides virgo (L.).

Flocks of sixty and twenty were observed on spring passage at Ramleh on 16.iii. and 18.iii.

Rallus aquaticus.

R. a. aquaticus L.

One record at Rafa on 27.xi. This bird is of the typical dark race and not *korejewi* from Central Asia.

Porzana porzana (L.).

The Spotted Crake was common on passage near Rafa from 7.ix. to 11.x. It was also observed at Ramleh on 8.iv.

Crex crex (L.).

First seen on autumn passage at Rafa on 22. viii., but became common during the first fortnight of September, arriving with the Quail. The numbers decreased towards the latter half of September, and only a few were met with during the first half of October.

On spring passage it was common at Ramleh in early May.

Gallinula chloropus.

G. c. chloropus (L.).

First observed on autumn passage at Rafa on 25. ix., when several immature birds appeared, usually taking refuge in tents. An adult was captured on 3. x., after which date no more were seen.

A plentiful resident in the marshes of the coastal plain round Julie and on the Brook Kishon.

Fulica atra.

F. a. atra (L.).

A winter visitor in small numbers to southern Palestine, the earliest record being on 4. xi. at Rafa, but suitable Coot ground is so scarce that we could not expect to find this bird in any numbers anywhere.

Burhinus œdicnemus.

B. œ. saharæ (Rchw.).

This is the breeding bird and probably resident in southern Palestine and northern Sinai. The numbers are increased in late autumn and winter by visitors from elsewhere. Two eggs were found near Rafa on 5. vi., and near Jaffa at the end of May.

Birds shot at Rafa on 10. ix. and 15. xii. agree well with a large series of *saharæ* from North Africa, but another shot on 15. xii., and one of a pair of which the other bird was also obtained, are distinctly darker and greyer than any *saharæ* at Tring, and cannot be matched by specimens of *B. œ. œdicnemus* from Western Europe, from which they differ in being much greyer. But as the other bird of the pair is typical *saharæ*, I can only ascribe the difference in tone to individual variation, especially in a species which is subject to considerable individual variation in colouring.

The wings of two males measure 224 and 246 mm., and that of a female 246 mm.

Cursorius gallicus.

C. g. gallicus (Gm.).

A common summer visitor to southern Palestine and northern Sinai, at least as far north in the coastal plain as Ramleh, where it is rare. The spring arrival was not noted. The autumn departure synchronises with the hibernating of lizards and insects which are the main food; it takes place about 21. ix. None were seen after 4. x., except a family party which remained near Shellal till at least 3. xii.

The birds lay round Rafa and Belah in June, eggs being found near Ramleh on 25. vii. by Sladen, and young on 30. vii. They kept in family parties till they departed, and showed no sign of "packing." Young birds commence to assume adult plumage in the middle of October, which is completed by early December.

Glareola pratincola.

G. p. pratincola (L.).

Observed on spring passage at Rafa on 3. vi., when a party of eleven birds rested near a lake for eight days, and on autumn passage on 4. x. near Shellal, when a few were seen on the desert.

This is a common breeding species on the Wadi Rubin, nesting among open rushes on sand. Birds were sitting on full clutches on 30. vi.

Glareola nordmanni Nordm.

Not observed by me, but Sladen obtained one on the Wadi Gaza on 4. x.

Charadrius hiaticula.

C. h. tundræ (Lowe).

A few non-breeding birds were at Rafa in June, and remained till August. None were seen in September, but throughout October and till January they were common on the coast from Jaffa to Rafa.

Charadrius dubius.

C. d. curonicus Gm.

A few were at the mouth of the Wadi Gaza in July and August. Large flocks appeared at Belah in the middle of October.

Charadrius alexandrinus.

C. a. alexandrinus L.

Plentiful on the coast of northern Sinai from early June to the end of July, but not nesting. Several were seen near Rafa in the middle of September, and near Gaza in the middle of November. Specimens were obtained by Sladen at Jaffa on 25. vi. and 14. i., and near Carmel on 26. iv. It would therefore appear that this bird is a resident on the coast.

Charadrius leschenaulti Less. (=*geoffroyi.*)

The status of this Plover is most confusing in the Near East. It appears to be found on the coast of southern Palestine, the Red Sea, and Somaliland throughout the summer, not individual birds, but large parties. We found it common at Rafa in June and July. Several were seen in August and September, and one in October.

Charadrius morinellus L.

A common winter visitor to the desert plains between Rafa and Shellal, but not noted north of Gaza. It first appeared at Rafa on 7. xi., and the numbers were much increased between 11. xii. and 19. xii. They decreased in early January, but considerable numbers remained. The departure in spring was not noted.

Charadrius apricarius L.

A winter visitor in small parties from early December to January and February, but not seen far from the coast,

Vanellus vanellus (L.).

A common winter visitor to the coastal plain and northern Sinai from 1. xi. to March, a few being seen in the Shephelah in December.

Hoplopterus spinosus (L.).

A few were seen near the coast from early September to early January.

Erolia ferruginea (Brünn.).

One was seen at Belah on 2. vi. in full breeding-plumage. Not otherwise observed.

Erolia alpina.

E. a. pusilla (Falk.).

The large size of Palestine birds, wings 115 to 116 mm., and culmens of 39 and 40 mm., compels me to refer them to this somewhat doubtful race from western Siberia.

Small flocks first arrived in the Wadi Gaza on 7. vii. They were all adults and in nearly full breeding-plumage. On 3. viii. a large influx of mixed old and young arrived on the coast near Rafa, many adults still showing signs of breeding-plumage. By the middle of September, Dunlin were in thousands on the coast, after which their numbers rapidly decreased, till by the end of November very few remained, and these were still about in early January.

Erolia minuta (Leisl.).

Many were on the coast between Gaza and Rafa from 1. vi. to early January, their numbers receiving no visible increase in autumn. One was shot in the Jordan Valley on 28. x.

Philomachus pugnax (L.).

Several Ruffs and Reeves remained during summer on the coast of southern Palestine, the Ruffs showing no sign of assuming breeding-plumage. On 28. viii. the first autumn migrants arrived, the cocks usually having a few ragged remains of the spring ruff. These birds remained about till early October, when they all left.

At Ramleh, two cocks, shot on 22. iii. and 1. iv., show no sign of breeding-plumage.

Of four males, the wings vary from 177 to 186 mm., and the culmens from 40 to 45 mm. Of three females, the wings vary from 143 to 150 mm., and the culmens from 33 to 37 mm. It is remarkable what great variation in size of the culmen occurs in this species, especially in the Reeve.

Gallinago gallinago.

G. g. gallinago (L.).

From the end of September a few are to be found in suitable places.

Limnocryptes gallinula (L.).

One was shot at Shellal on 21. xi., and it was not uncommon in the coastal plain in winter.

Crocethia alba (Pall.).

A few arrived on the coast near Rafa on 16. ix. in company with Dunlins, the birds being in half-moult. Their numbers were increased by 23. ix., when they occurred in flocks of thirty and forty. On 29. ix. they were still more numerous, but by early October they had nearly all gone. A few observed as late as 13. xi.

Limicola falcinellus.

L. f. falcinellus (Pont.).

Two examples of the Broad-billed Sandpiper were obtained at the mouth of the Wadi Gaza on 5. viii. and 10. viii. These birds are probably much overlooked. They appear to be a regular and not uncommon autumn visitor to the Nile Delta.

Tringa erythropus Pall.

One was seen at Belah in breeding-plumage on 1. vi. and again on 5. vii., probably the same bird. Not obtained.

Tringa totanus (L.).

Not obtained. Three were at Belah throughout June. Autumn migrants commenced to arrive on 7. vii., their numbers increasing on 3. viii., and from then to early January there were always a few to be seen on the coast from Jaffa to Rafa.

Tringa stagnatilis (Bechst.).

A few turned up near Gaza from 7. viii. to 15. viii. No others were seen. Three were obtained.

Tringa nebularia (Gunn.).

Not obtained. One was seen at Belah in breeding-plumage on 4. vi. A few were to be found near Gaza from 21. viii. to 25. xi.

Tringa ochropus L.

Obtained on the coast of southern Palestine on 23. ii. and 1. iv. A not uncommon winter visitor.

Tringa hypoleuca L.

Not common, the first autumn arrival at Gaza arriving on 10. x. More numerous on spring passage, when it was obtained from 26. iv. to 26. vi.

Himantopus himantopus (L.).

A few can be seen throughout the year on the coast and coastal plain. No evidence of breeding. Not obtained.

Recurvirostra avosetta (L.).

Observed near Rafa on 29. vii., 26. xi., and 11. xii. Rare.

Limosa limosa.

L. l. limosa (L.).

The only bird seen, a female of the year, was shot at Gaza on 29. viii. Wing 211 mm.

Hæmatopus ostralegus L.

Only observed once, when a party of four appeared near Gaza on 2. vii. Not obtained.

Numenius arquatus (L.).

A scarce winter visitor to the coast. Not obtained.

Numenius tenuirostris Vieill.

We did not observe this species. Sladen obtained a female at Shellal on 4. x.

Numenius phæopus.

N. p. phæopus (L.).

One was shot at Shellal on 4. x., and others were heard passing over at night at the same place on 26. xi.

Scolopax rusticola.

S. r. rusticola L.

A not uncommon winter visitor to southern Palestine. Obtained in the Shephelah on 2. i., in the Judæan highlands on 27. i., at Belah on 1. i., while Sladen shot one at Jaffa on 8. i.

Hydrochelidon nigra.

H. n. nigra (L.).

An immature bird shot at Shellal on 30. ix. is the only record.

Hydrochelidon leucoptera (Temm.).

A few were at Belah in early June, but showed no signs of breeding. Also obtained on 11. viii.

Hydrochelidon leucopareia.

H. l. leucopareia (Temm.).

An adult in winter plumage shot at Shellal on 30. ix., and another on the Wadi Rubin on 14. x. are the only records.

Larus fuscus.

L. f. fuscus L.

Twenty-seven birds (eleven adults and sixteen birds of the year) arrived at the mouth of the Wadi Gaza on 2. viii. so exhausted that they could scarcely fly, and were walking among the troops like chickens. A few were seen on the coast throughout October. No other gulls of any sort were noticed at any time.

V.—*Ornithology of the Maroccan "Middle-Atlas."*

By Captain LYNES.

(Plates III.–XII.)

PART I.—ITINERARY.

WE, in the Navy, who in peace time have chosen to supplement our professional duties by the more active pursuits of the field, have sometimes found their curtailment, caused by the conjunction of Neptune and Bellona, rather trying to the internal economy; it was therefore not entirely mere pleasure-seeking that, the Armistice having closed the more serious pages of the war, led me to give up command of the 'Warspite' and obtain permission to get a little nearer the sun.

The companion who started with me, also in search of a "cure," had scarcely arrived at Gib. than he was recalled to England, and in consequence it was alone, with a moderate equipment, little more to recommend myself than an introduction to our Minister for Marocco, and feeling rather like a bird newly-escaped from its cage, that I landed at Tangier last 12th of April.

Marocco had been chosen for its climate and accessibility, it was near home in case anything unexpected happened, and our meagre knowledge of its Natural History * afforded ample scope for some useful work among the Birds.

But, save for a vague sketch programme based on the probability of the Great-Atlas and Central parts being inaccessible, and that therefore, if the non-shooting difficulty could be overcome, to follow up Mr. Meade-Waldo's work † in the Forest of Mamora would present the best chance, I had about as much idea as the man in the moon as to the possibilities of travel, where to go, or how to get there.

However conspicuous the fact that one may avoid being quite a Mr. Verdant Green by "reading-up" the country before setting out on the trip, I think most of us often find, on or after arrival, that "the one thing" one might and should have read was absent from the literature so carefully waded through.

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* *Vide* Appendix I, "Notes on Orn. Bibliography of Marocco."

† *Vide* Ibis, 1905, p. 161.

And so in my case: the works studied had been those likely to provide news about Natural History; all, except the mere bird-lists, written before, some very long before, even the Algeciras Conference of 1906, and though I do not for a moment regret the notes culled from the works of Hooker, Segonzac, Gentil, Pitard, and others, my general impression of Marocco before landing there, was that of the old Moghreb: heads on spikes around the city-walls, slavery and torture, vast camping equipments and retinues, Cherifian letters, monas, etc.

Had, for instance, Mr. Consul McLeod's excellent paper in the Journal of the R. G. S., August 1918, or even some of the French-Maroccan journals been among the literature studied, I should have realized how far the past eight years' policy of Général Lyautey, the maker of modern Marocco, had evolved order out of that mediæval chaos, and should in consequence have brought out a rather better equipment, and perhaps commenced work earlier in the season, both of which would have been advantages.

However, at Tangier I was soon put upon the right track. Sir Herbert White most kindly gave me not only letters of introduction, but suggested the possibility of my being allowed to visit the recently opened-up forests in the central parts of Marocco; and, further fortified in this new plan by help from Mr. W. B. Harris, I went on at once to Casablanca by steamer, and thence by rail the following day (14 April) to Rabat, where my cause was taken up by Mr. Vice-Consul Lomas, whose kind and invaluable help all through my stay in Marocco I recall with the deepest gratitude.

Rabat, lying *vis à vis* across the Bou Regreg River, with Salé, the old lair of the "Sallee Rovers," was gay with bunting; the new Governor-General of Spanish Marocco had just arrived to pay his State visit to Général Lyautey.

In consequence, before I could present myself at the

Résidence Général a few days elapsed, which enabled me to make a few rambles up the Bou Regreg estuary and to spend the 20th of April in the north-western edge of the Forest of Mamora near Kenitra, an easy hour's train journey from Rabat.

Considerable migration was in progress near Rabat, but markedly less in the Forest, pointing clearly to the coast-line being the birds' "high road." The most numerous migrating species noted were Whitethroats, Willow Wrens, Swallows, Redstarts, and Woodchat Shrikes; but Garden, Blackcap, Orphean, and Subalpine Warblers, Pied Flycatchers, Wheatears, Sand-martins, Bee-eaters, Rollers, and many other species were well represented in the passing throng.

Among breeding birds, the Chaffinch, Greenfinch, Goldfinch, Serin (with young abroad) and Spanish Sparrow were conspicuous in the orchards, as was also the Bulbul. But none of the other "African" Passerines (*Argya*, *Telophonus*, *Diplootocus*) were present; the Grey Shrike (apparently *algeriensis*) had been plentiful on a waste part of the plain between Casablanca and Rabat, but from later observations and information, I think in this part of Marocco one should probably go to the "Zizyphus zone" (see Plate XII.) to find the Bush-Babbler and Tschagra, and to the southern and south-eastern glades of the Forest of Mamora for the "*arabs*" Bustard, Guinea-fowl, and Francolin.

Near Kenitra, the Forest of Mamora consists of very moderate-sized cork trees, varied by wild pear and sapling corks. Open glades, with occasional "maquis" of cistus and palmetto, are frequent, and the light sandy soil is everywhere clad with a luxuriant plant-growth, various bright-flowered Compositæ predominating (see Plate X. *b*).

The bird-life was disappointing for so nice-looking a place. The "maquis" seemed to hold scarcely anything. I found nests of Black Kite, Long-eared Owl, Raven (*C. c. tingitanus*), and Blue Tit (*P. c. ultramarinus*); Chaffinches, Great Tits, Orioles, Serpent Eagles, Wood Pigeons, perhaps Hobbies, etc., were likely breeders; but Creepers, Nuthatches, Coal Tits, Jays, Green Woodpeckers, and many other species, found later to be so abundant in the Middle-Atlas forest, seemed to be entirely absent.

From all accounts, the nature of Mamora here is fairly typical of its greater part; nevertheless an eight-hour ramble like this, in its edge, cannot be regarded as more than a first impression of so great an expanse of "forest."

His distinguished guest having departed, Général Lyautey received me, and with the greatest kindness invited me to visit any of the "Postes Militaires" that I wished.

Commandant de Beaucoudrey, (acting) Head of the "Département des eaux et forêts," generously offered to take me in his motor-car for a trial trip to the forests of Azrou and Ain Leuh: if, as a result, these districts should seem to me worthy of a prolonged stay, I could return and settle down there.

Leaving Rabat P.M. the 23rd of April in one of those (to me) amazing Ford cars, which despite its four years' hard work carried us nobly over the up-country obstacles when obliged to leave the main road, we spent the night at Meknez, and the following afternoon bade *au revoir* to Colonel Colombart and Commandant Lefevre, our hospitable hosts, and proceeded southwards to Azrou.

The physical features of the country traversed having been more or less indicated in Plate XII., it is unnecessary to add more here. On the plateau of El Hajeb we were treated to a long cold thunderstorm, but when we passed the camp of Ito at its highest point, our discomforts were more than recompensed by the glorious view that opened out ahead. To the south-westward, as far as eye could stretch, lay a tumble of steep-sloped mountains bathed in distant evening sunlight; thence to the south-eastward, in middle distance, the serrated crest of the great forest, under a lifting canopy of indigo cloud, frowned sombrely down from its two-thousand foot advantage on the green expanse of the Tigrigra valley. Twenty minutes later we had crossed the valley and were at Azrou, with the Middle-Atlas rising, so to speak, from our back door.

Suffice it to add that during the next three days we made short excursions on horseback from Azrou and Ain Leuh into the forest, every moment of which brought some new delight, ornithological or botanical, and that we returned to Rabat with the desire strong in my mind to return to the Forest as quickly as possible in order to take a full stock of its treasures during a prolonged stay.

Again, thanks to the kind arrangements made for me by Général Lyautey and his Departments, three days later (1st of May) found me leaving Rabat by train with equipment for a long stay at Azrou, where I arrived by *Camion postale* from Meknez the following day, and remained until the 17th of July, an extremely happy ten weeks, thanks to the never-ceasing interest of my work and the charming society of my French friends, Capitaines Bousquet and Chaplet, and the officers, who graciously made me an honorary member of their Mess.

Here my time was spent making daily excursions into the forest and its dominating "Plateau"; the Tigrigra valley offered comparatively little of interest, though the river often supplemented our menus with delicious brook-trout up to a pound in weight.

In June, while the advance column was operating in the Upper M'louya territory, a vedette encampment established by Azrou on the southern edge of the plateau near Jebel Hebbri, enabled me to spend several nights under canvas there, enjoying the hospitality and companionship of Sous-Lieutenant Leriche, and (during the days) to take better stock of the Plateau than would otherwise have been possible.

Night work was nowhere possible, for we were close to the mountain encampments of the still hostile Berber tribes: even in the day-time it was never permissible to go out without an armed guard of "Mokhraznis" or "Goumeurs," besides which I had been unable to recruit a native taxidermist, so that the working hours available for field-work were curtailed by much time spent at the skinning-table and over the various other collections.

My peregrinations covered some ten miles length of Forest above Azrou, many square miles of "Plateau," including two traverses, to Timoudit and back, and the two days' trial trip to Ain Leuh; and they leave me confident that the territory explored was thoroughly representative of the northern parts of the Middle-Atlas as far to the eastward and westward of Azrou as the vegetation and physical features remain similar, also that, with the exception of Owls, my observations and collections fairly gauged the Resident and Summer bird population.

I cannot close this "Itinerary" without recording my grateful thanks to Messrs. Rabino and Selous, of H.M. Consular Service, and to Lieutenant Poznanski, who, in addition to those gentlemen already mentioned and many whose names would make a very long list, so generously gave their ægis and help to my plans; nor can I ever forget the hospitality and interest in my work of Général Bertrand, commanding at Meknez, and his staff.

It was indeed delightful, wherever I went in Marocco, to breathe again the atmosphere of French "bon camaraderie," that remains one of my happiest remembrances of Dunkerque and the War.

PART II.

THE "MIDDLE-ATLAS."

(Attention is invited to the maps in Plates XI. and XII.)

Owing to the hostility of its Berber inhabitants, who never in past days recognised the authority of the Sultan, and even now, that of the French only on their fringes, the Lesser-Atlas and Eastern Great-Atlas mountains have remained almost unknown to Natural Science up to the present day, while the rest of French Marocco has been either "skimmed" or comparatively well worked.

The Riff Chain, which covers practically the whole of Spanish Marocco except a coastal strip, is equally unexplored, but differs from the French zone in that it seems likely long to remain so, unless some naturalist gets on the soft side of Raisuli and the other Riffian Sheiks.

During the eight years of French control much has been done in Central Marocco by the Survey Departments (incidentally considerably lowering many of the peaks, *e. g.*, Jebel Aiachi from circa 14,100 to 12,300 feet, etc.), and in some dozen French works * on Marocco the geology of this region is discussed, though admittedly with much speculation owing to scanty material; but in works accessible to the general public (if anywhere?) its Biology, save for a little economic botany, remains as yet a blank.

It is thought, therefore, that a slight digression from our own particular branch will here be permissible, and that the reader will find the following little résumé of what has been published up to date about the Physical Geography of the Middle-Atlas of use in following later, a few speculations on the wider subject of Geographical Distribution in Mauretania.

(a) *Geology.*

[I wish here to acknowledge the kind help of Mr. Campbell-Smith, of the British Museum, to whom I submitted my small collection of minerals, but, alas! no fossils.]

Broadly speaking, the Middle-Atlas consists of the chain of mountains, mountain masses, and high plateaux extending in a north-easterly direction for some 220 miles from (about) Demnat in long. 7° W.; terminating, to the eastward in the valley of the Middle M'lonya, and to the northward near Taza. For its western 80 miles, viz., from Demnat to the water-parting $\frac{\text{O. el Abid}}{\text{O. M'lonya}}$ the chain is linked to the Great-Atlas, and appears to be more a tumble of mountains and mountain spurs accessory to the latter, than a separate chain†.

The Great-Atlas then bends away about 15 degrees to the southward, while the Middle-Atlas continues for the remainder of its 140-mile easterly stretch, as a chain of its own, clearly separated from its sister by the ever-widening valley of the O. M'louya. The final 60 miles of the chain is spread out in a quadrangular mountain expanse of some 1500 square miles, one main line of peaks running N. 40° E. to form the eastern terminus; another, containing the dominant massif of Moussa on Saleh (12,425 feet), curves gradually to the northward, and forms the northern terminus of the chain near Taza.

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* Louis Gentil, "Le Marocphysique," 1912, and several papers in "Comptes rendus," 1915, 16; other authors are Rohlfs, Pitard, Bernard, De Foucauld, Segonzac, etc.

† In similar manner the complementary chain called the "Anti-Atlas" is linked to the Great-Atlas on its south side, and French geologists consider the Lesser- and Anti-Atlas as fundamentally the same earth-crinkle.

It is thought that, as in the case of the Great-Atlas, the first upheavals of the Middle-Atlas occurred during late Primary and early Secondary times, and that later, the basal plateaux of Jurassic formation emerged from the sea, placing above water the whole range with its present trend as we now know it.

Elevation over perhaps all Marocco continued, and there is good evidence to show that in Miocene times, all the flanking hills and plateaux (including the plateaux of El Hajeb and Oulmes) to the northward of the Middle-Atlas were also above water, their bases washed by a sea that connected the Mediterranean and Atlantic—and separated from Africa the Riff chain, at a time when the latter was joined to Europe.

The theory is, briefly, that the Riff belongs fundamentally to the Andalusian Sierra Nevada, that up to (probably) Pliocene times the two were connected by dry land via Apes Hill—Gibraltar, in the West; and in the East (doubtfully ever above water) via Melilla—Alboran Island—Cape de Gata; and that the Mediterrano-Atlantic connection, admitted as having existed at this period, was by the "détroit Sud-Rifain" of French geologists, which, it may be noted, equally cut off both the Algerian Tell and Middle-Atlas from the Riff.

This phase had been preceded by one in which the Sierra Nevada was itself isolated from Europe by the "détroit nord Bœtique," and was succeeded by that which simultaneously (in geologic chronology) closed the "détroit sud-Rifain" and opened the Straits of Gibraltar, so as to group the land and sea areas as they exist to-day.

Throughout the Middle-Atlas, the distinguished French geologist, M. Gentil, has discovered evidences of much Tertiary or "Recent" volcanic disturbance.

My personal acquaintance with the Plateau showed that its surface, at least as far south as Timoudit and for many miles around Jebel Hebbri, is composed almost entirely of volcanic tufa and basalt; a vast, scarcely undulating flat, broken only by sundry "Volcanic Kopjes" and "Craters," the former chiefly collected towards the northern edge.

The "Volcanic Kopjes," of which Jebel Hebbri, standing some 500 feet above Plateau level, is the largest, are cones, nearly flat-topped or with shallow imperfect craters.

The "Craters" are without lip or any sign of ejected materials, and so, presumably, the result of subsidence; their sides, often very steep or even vertical, are of hard basalt of columnar or trap formation; some are as large as 500 yards diameter at Plateau level, and 300 feet deep; the smallest are mere "pot holes," 30 yds. × 20 feet (*sic*).

Beyond Timoudit, whose fortress is perched on the summit of a scoria-sided volcano which rises from an exposed limestone base to about 500 feet above the valley of the Ouad Guigou, I did not go: but viewed from the fortress, it was clear from the appearance of its northern face that that part of the main chain of the Middle-Atlas is largely composed of limestone, and lacks the volcanic elements of the Plateau, except, perhaps, just where its base meets the Plateau.

Two other minor features worthy of note in the Range are, (*a*) the "Mamelons" in the Tigrigra Valley at the base of the Range, (*b*) the "Terrace" on its North Slope.

The "Mamelons" are a number of separate little hills up to 500 feet high, of two types: the "mound," an unbroken rounded hummock like an apple-pudding, and the "rocky," surmounted by small crags, dropping in screes on the north and west faces down to their bases; some abut so intimately on the "North Slope" as almost to form a spur, others stand clear on the floor of the valley (see Plate III. *b*).

They seem to be formed of Primary rocks, slates, and schists; but I can advance no theory as to their origin.

What I call the "Terrace" is really a single row of microscopic plateaux at a half to a third of the way up the "North Slope."

Commencing at Azrou, where one of them is earmarked as the site of a pulmonic sanatorium, these little plateaux extend to the westward, it appeared to me, at any rate as far as Ain Leuh.

Were it not for the numerous gullies, now carved deep and wide in the Slope, many of the "Terraces" would be continuous ; and since they divide the limestone outcrop from that of the clay-slate and old rock below, it is conceivable that this feature is an ancient geologic formation of the "beach" type, so that the name by which I have chosen to distinguish it from the main "Plateau" may be less inappropriate than at first glance.

The "Terrace" has soil for a good crop of wheat, but only those parts near the Military Posts are cultivated, the remainder can only, as yet, be used as pasture at "shepherd's own risk"—quite a real risk, for even during my short visit the Berber mountaineers made several raids, resulting in loss of stock and casualties among the herdsmen.

I may here say that I could see neither in "Terrace" nor "Mamelons" any analogy to the "escarpment" and "boulder-mounds" described by Maw at the base of Great-Atlas, south of Marrakech.

(b) *Physical and Biological.*

To the traveller entering the Lesser-Atlas from the Atlantic coast, by the "Route Impériale" through Meknez, nothing is more apparent than that on arrival at Azrou, he is about to enter a quite new type of "country."

After having made his first step-up from the maritime plain (or "Meseta"), except for the absence of its cork-woods, the Sebu marshes and the narrow "Zizyphus zone" of the first foot-hills, he will find in the Fez-Meknez plain little of novelty ; the same flat wastes of palmetto scrub, the same types of cereal cultivation, and composition of floral tapis, with bird-life corresponding to the similar environment, The surrounding hills have precisely the same monotonous aspect, common to the more arid parts of the Mediterranean littoral.

The second step-up on to the Plateau of El-Hajeb will produce trifling further change compared to what might be expected from the nature of its stony pastures, but a few of the lower birds—such as the Stonechats, Bee-eaters, and Lesser-bustard, have dropped out; the Stork, Corn-bunting, Crested-lark, and Lesser-kestrels remain ubiquitous as hitherto; Calandras "scream" as over the lowland wastes, and no new forms occur.

The dip of the Tigrigra valley still brings little novelty, but with the "Mamelons" at the base of the Middle-Atlas all commences rapidly to change.

The "mound" type of Mamelons are mostly clad with a monotone of genista scrub, growing close and wiry, like bilberry, and for all the world resemble one of our sombre Northern moors, until midsummer's inflorescence throws a mantle of brilliant yellow over the whole, and lends its charm to the aerial song of the Tawny-pipit—the sole feathered inhabitant. Stretches at the base, in unequal contest with the torrential rain-storms, fail to retain the scantiest soil, and are bare to the rock or mere shale-slides.

The "rocky" type of Mamelons are much more diverse both in plant and bird life; Neophron, Kestrel, and Raven nest in the largest (25 feet circa) crags, the Little Owl in the smaller ones, Moussier's Redstart and the Blackchat among the boulders; the Redleg prefers the dwarf ilex scrub, and *Prunella* on the screes, while the Linnet and Cirl-bunting find nesting sites in the stunted juniper shrubs that grace what passes here for soil.

Here, then, lies the borderland between the old and the new zones: Azrou's ancient mud walls, like those of El-Hajeb and the cities of the plain, abundantly supplied with nesting holes and niches, fail to attract their swarms of Lesser-kestrels, though a few Storks find here their "Ultima Thule"; the monotonous chortle of the Corn-bunting is heard no more, and the Crested-lark begins to be replaced by the Wood-lark. Here, too, we meet for the first time the Black-chat and Tawny-pipit, and stray examples of Seebohm's Wheatear, while overhead the Golden Eagle and Lammergeier sailing out from the mountains in quest of food, tell of the riches beyond.

Overhanging Azrou and its "Mamelons," the Northern Slope of the Lesser-Atlas with its abrupt 2000 feet incline, median "Terrace," and occasional crown of precipitous crag, would be a feature sufficiently striking to the south-bound traveller, even were it bare or clad only with the poor brushwood recently passed by on the Plateau of El-Hajeb: but, clothed as it is for its upper two-thirds and crested with dense forest, he cannot fail to observe that he is about to enter a type of "country" quite different from anything between it and the Atlantic, or for many miles to the northward.

Botanically, the Forest is essentially "cool temperate." Ilex (*Quercus ilex*) forms the matrix of the tree-slope, good 40–70-foot trees up to 5700 feet, above which altitude they dwindle in size and number, and soon peter out altogether.

Cedars (*Cedrus atlanticus*) commence to intersperse themselves at about 5200 feet (once on a time certainly lower), at 5600 feet are at their zenith of size and beauty, magnificent trees of 120 feet and more; thence to the crests they increase in number but lose somewhat in stature, until the species remains the sole representative of tree-growth, and spreads on to the Plateau, but there only to crown the "volcanic kopjes" or line the walls of the larger "craters," for up there the Cedar seems to abhor a level surface.

As in Europe and Asia, the forests of Marocco have suffered much in the past from the unfettered toll of the aborigines; it is grievous here, in the heart of the Cedar zone, to see the number of dead monarchs standing and lying in wasteful decay, their gaunt barkless trunks and stag-horns the whiter for the black scars of fires lighted at the base in hopes that, perhaps, one in three would thereby be brought to a fall. However, the forests are now being judiciously exploited and preserved by the French administration, and much of the fallen timber that is not too rotten is being utilized, but the woodcutters have always to be guarded from attack, and enormous areas of forest, the safe retreat of the hostile Berbers, still remain economically inaccessible.

Curiously, despite the quantity of dead cedars, full of holes and crannies, very few birds seem to care to nest either in them or in the dense foliage of the living trees, the Ilex has almost exclusive preference.

Interspersed with the Ilex occur small belts and groups of Spanish deciduous oaks (*Q. bellota*), some with fine straight 50-foot trunks overtopping even the largest of the Ilex.

With a few maple and junipers (*Juniperus phœnicea*) in the upper, and pigmy ash and parasitic ivy in the lower zone, the census of tree-growth of the Forest is about completed.

The forest undergrowth (besides, of course, saplings of the trees) consists in the Ilex zone, mainly of Laurustinus and Holly, with occasional Viburnum and Pyrus bushes, and a knee growth (where stones permit) of butcher broom, etc.; while with the cedars up to their ultimate limit, especially in the burnt tracts, (although the live trees are seldom so packed as to "shade-out" undergrowth away from the proximity of the bole), are generally associated thickets of the beautiful *Cytisus battandieri* *.

The *clarières* and *cols* are attractive with bushes of many kinds. Hawthorn predominates all through the Forest zone up to the brink of the Plateau, and is a favourite host of the red-berried mistletoe (sometimes too much so for its life); of other species, honeysuckle, bramble, holly, cistus, cherry, locally wild vine, and several *Genistæ* are among the most prominent, but the majority drop out some way before the Plateau is reached.

Of flowering plants, a large pink pæony, abundant throughout the Cedar zone, must be acknowledged Queen; *Cytisus battandieri*, with large drooping racemes of golden yellow, becomes a wealth of colour and fragrance in mid-

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* Special to Maroccan Atlas.

June, Solomon-seal, grape-hyacinth, and numerous other bright Liliaceæ, the hare-bell, and a few other shade-lovers form the bulk of the forest's floral adornments; while, as might be expected, the clearings have also a selection of "cosmopolites" from the plains below.

In the upper Forest zone, the flanks of some of the gullies are too steep and rocky to support more than a minute vegetation; and the natives use these clearways largely for going up and down the North Slope, but the "paths" can only be so called by courtesy, and the pedestrian may far better wander judiciously through the forest than keep to such a *via dolorosa* of stones and boulders.

Above Azrou are numerous springs issuing between 5000 and 5600 feet; but then, Azrou is celebrated for its "*sources*"; for even in these vegetation-clad mountain slopes a perennial water-supply is accorded all the customary reverence of dwellers in a thirsty land. Bird-life is abundant, and at the moment of first entering the Forest we feel almost transported to North Europe. Here are Chaffinches, Robins, Wrens, Missel-thrushes and Blackbirds, Jays, Creepers, Tits, Pied and Spotted Flycatchers, Redstarts, and other northern species in the greatest profusion; the racial characters that distinguish practically every one of these southern forms are in many cases too subtle to detect in the field (some not too easily at the "table"!).

But a Roller screams; overhead, a pair of Ravens are mobbing a Black-kite; a barking and crashing in the brushwood discloses the hasty retreat of a band of Barbary-apes, the lights and shades are tropically intense; the sounds, even the notes of some of our pseudo old friends are new, and we are recalled to the South and reality.

In some parts the "North Slope" gives way to the Plateau quite abruptly, but for the most part there lies between the two an attractive zone, varying from a half to one mile or so of "Barrens" (see Plate VII.) and/or "Crest-mounds." The "Barrens" are open stretches of stony, mixed volcanic and limestone ground, thickly clothed with grass and herbage, much studded with hawthorn bushes towards their northern edge, and with clumps of cedars deficient in undergrowth on some of the more rocky ridges. The "Crest-mounds" are a jumble of giant midden-like mounds of dark earth profusely mingled with limestone boulders and stones, half-clad with hawthorns and small Ilex trees and bushes. But, attractive as it looks, this zone has comparatively little wealth of bird-life. Woodlarks are very numerous (but no Skylarks or Shorelarks). Rock-sparrows favour this zone; these, and a few Tawny-pipits are the chief inhabitants of the more open parts: the cedar clumps, however, retain some of the forest species and add the Hoopoe and Starling in considerable numbers. Here, with the first streaks of dawn, foxes, civets, boars, etc., may be seen making for their forest lairs after a night on the "Plateau."

The "Plateau," save for that of its volcanic kopjes and craters, is devoid of tree-growth. In spring and summer, with the exception of the few groups of protruding boulders, and the lowest parts of the long sweeps that have retained winter's rain and snow until too late in the year for Nature to clothe them, the whole expanse is covered with rich pasture. Everywhere the ground rings hollow to the tread: there must surely be impervious rock not very far down? in order to hold up the "dayas" so late in the season—some indeed, all the year round (see Plate VIII.).

On the Plateau itself, Seebohm's Wheatear, Atlas Shore-lark, and Skylark abound, and in summer practically *voila tous*! save for an occasional Tawny Pipit or Quail; in winter, Snipe and Wildfowl are found there. Jerboas honeycomb the Plateau with their holes.

The bird-life of those "Volcanic kopjes" and "Craters" which possess tree growth is much the same as that of the Upper Forest and "Barrens;" it depends somewhat on the amount of undergrowth, but the Raven, both the Woodpeckers, Hoopoe, Moussier's Redstart, Creeper, Spotted Flycatcher, and Coal-tit, are almost certainties; and if the undergrowth is good, add the Blackbird, Robin, Wren, and *Hippolais polyglotta*.

On the 29th of June we visited a large "daya" on the

Plateau, overshadowed by the Northern Crest-hills, here composed of limestone and rugged in the extreme.

The lake lay in a shallow circular depression of about 25 acres in extent; its water was clear, at the deepest only just above the stirrups of my companion who rode across the lake, and the bottom, save for a thin carpet of loose (? ligneous) matter, quite firm.

It was a lovely picture at sunrise; Ruddy Sheldrakes and clamorous parties of Stilts, alarmed, flew disconsolately over the lake adding their bright contrasts of colour to the carpets of white Water-crowfoot, pink Polygonum, and delicate greens that varied the dark mirror surface.

Out near the middle lay a small islet of reed-growth which sheltered a few Coots (*F. atra*) and Dabchicks, probably breeding there; but despite the assurance of a recent visitor that we should find here "toutes espèces d'oiseaux," a single duck too far off to diagnose (but ? *Marmaronetta*), completed the list of the daya's feathered inhabitants. Curiously, neither Stilts nor Sheldrakes showed signs of breeding, past or present; all were adult.

Some "Volcanic Kopjes" are thickly crowned with cedars; others, besides lacking trees, refuse to provide soil enough to more than half-clothe their slopes with herbage. Such a one is Timoudit.

The Craters are curious: the large ones contain cedars, fine trees where the soil is sufficient, and their roots are well below the rim, but the poor things to whose lot has fallen a more exalted position reach the brink only to meet the bitter storms of winter in full violence, and in consequence are splay-topped and tortured in appearance.

So cleanly are the "Craters," as it were, "scooped out" of the Plateau that unless some of these bizarre cedar-tops protrude, no suspicion of the existence of "a hole" occurs to the traveller until he stands on the very brink of the pit.

One remarkable crater near Jebel Hebbri is exceptionally abysmal, about 250 yds. diameter at Plateau level and (judged) not less than 300 ft. deep. Ninety per cent. of its side surface is vertical; there is only one difficult, but possible scramble by ledges down to the blunt-coned talus at the bottom.

A few cedars rooted in the upper ledges protrude their weather-beaten tops; nearly all the interior except the vertical is thickly clothed with shrub vegetation, species varying noticeably according to sunny- and shady-side of the pit.

In the cliffs (on the 29th of June) were breeding-colonies of Black Ibis (*Comatibis eremita*), Choughs, Kestrels, and Starlings; Alpine Swifts were swirling round the rim, and it seemed almost uncanny to hear a Blackbird singing at the bottom of the fearsome pit.

Beyond Timoudit, the Plateau extends many miles to south-westward and westward, in which direction cedars are visible on the horizon, while to the south-eastward the "Route" soon ascends to cross the main chain of Middle-Atlas peaks. Except for a few, rather poor, patches of woodland on one of the northern slopes of these peaks the general aspect of the Chain, as viewed from Timoudit (my furthest south), appeared stony and bleak.

Speaking generally, the *facies* of all life in the Middle-Atlas is essentially a "cool temperate" one. One interesting feature is the long or slender bills of some of the bird-forms as Skylark, Shorelark, Robin, Nuthatch, Missel-Thrush, etc.; another, apparently, is the rarity of migratory bird-passage through the longitude of Azrou.

Climate.—Up to midsummer except for two rainy days in the first week of June, the climate was perfect; dry, azure skies, hot sun, cool or cold at night. For eight days at the Solstice (19–26 June) occurred what I was told is an annual phenomenon: each day began hot and cloudless as hitherto; then, about midday, the light northerly breeze dropped and gave place to a southerly one, clouds formed from south to west, and about 2 P.M., preceded by a fall of temperature (which the winged insects invariably accepted as a warning to take cover), there commenced a violent storm of lightning, thunder, and rain or hail, lasting from three to seven hours. Then peace returned, but the succeeding nights, especially on the Plateau, were bitterly cold. Some of the storms were terrific, typhoon-like in their deluges. The hailstones were often of special brand, ranging from Firecrest's egg size to great lumps of ice as big as a Hawfinch's egg. It was very desirable, to say the least of it, to take cover when these little trifles were coming down—they hurt even on one's shoulders—but for the poor creatures who could find no shelter! Just before one of these hail storms I found a Whitethroat's nest containing four eggs, out in the open; the storm lasted half an hour, then I went to look at the nest; two of the eggs were smashed and three big hailstones lay on top of them. I thought the nest looked deserted before, but do not believe the bird *could* have saved the eggs by covering them without being killed or badly hurt herself. Subsequently, I rather expected to come across more such catastrophes, but didn't.

These diurnal midsummer storms are mountain phenomena, and rarely extend more than a few miles beyond the Middle-Atlas; this year, however, some of them reached even Meknez, but their local nature is well illustrated by the fact that while Azrou had eight days of the storms, Ito, six miles distant, had only four. During these four days, four inches rainfall was measured at Ito; probably Azrou had at least three times as much in her eight days, but no register is kept there.

With regard to temperature; that of Azrou is probably about the same as Ain Leuh, viz.:—

March 1919	Av. daily max. °Fahr.	62	Av. daily min.	40
April	,,	,,	68	,,	44
May	,,	,,	79	,,	51
June	,,	,,	81	,,	57
July	,,	,,	92	,,	63

(Figures kindly given me by M. le directeur de l'Agriculture at Rabat.)

As for the winter; it is only necessary to see the masses of lichen on the trees in the forest to form an estimate of its climate. The total annual rainfall in the Middle-Atlas averages over thirty inches.

PART III.

RESULTS AND CONCLUSIONS.

The Ornithological novelties, *Sitta c. atlas*, *Erithacus r. atlas*, and the breeding of *Eremophila a. atlas* and *Parus ater atlas*, are perhaps smaller "results" than might have been expected; on the other hand, to fill in a blank area on the (Ornithological) map of Marocco, to extend the range of some of the subspecies as Coal-Tit and Shore-Lark, hitherto known only in the Great-Atlas, and others as the Skylark, not known to breed in Marocco, to confirm certain diagnoses founded on small material, and to add some grist to the mill of museums from which we enjoy many privileges, is, I feel, ample reward (or excuse!) for my pleasant holiday.

Before passing on to the systematic catalogue with which I propose to conclude this paper, and though aware that these trifles of fresh knowledge of the Class best fitted for natural dispersal, is a mere drop in the ocean of fact still required before any stable theory can be founded, I am loth to leave the subject of geographical distribution without a word or two, if only to pick up the few threads of speculation written by the illustrious Hooker nearly 50 years ago on the origin of the Maroccan Mountain-Flora*. Sir Joseph Hooker, reviewing the botanical results of his expedition in 1871 to the upper regions of the Great-Atlas, while remarking that "we only possess a fragment of its Flora, and future exploration may largely modify our conclusions . . . . . ." found that:—

(*a*) "nothing indicates any special connection between the Floras . . . . of the higher zones of the Great-Atlas, Algerian-Atlas, and Sierras of Andalusia."

(*b*) "the absence of distinct generic types is most marked."

(*c*) "in species . . . . the Mountain-flora of the Great-Atlas differs widely from that of the Andalusian Sierras, despite their comparatively small separation and the

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* Hooker (Ball & Maw) "Journal of a tour in Marocco and the Great-Atlas." London, 1878.

> exposure to not altogether dissimilar climatic conditions of their corresponding upper zones . . . . . Nearly half the plants found in the higher region of the Great Atlas are absent from the Andalusian Sierras, although a notable proportion are to be found in Central and Northern Spain."
>
> (*d*) "Of special interest is the fact that many of the species thus absent from S. Spain are plants of Central Europe . . . . (the so-called "Germanic" Flora), most of which extend to the north part of the Spanish Peninsula, although some of them are altogether wanting in the Floras of Spain or Portugal."

Hooker concluded that (for reasons explained in the book) "it is at least possible that the wide diffusion of many species constituting the so-called "Germanic" Flora may date from a period much more remote than is ordinarily supposed" (Pleistocene).

In the light of this conclusion Plate XI. *c* illustrates a possible early source of influence on Distribution, through the handing over, as it were, of the Riff by Europe to Africa.

Let us now review the subject in the light of (present knowledge of) the distribution of Birds in Mauretania*.

Excluding purely marine forms, the list of Sedentary (or resident) birds of Mauretania is represented by † 93 genera and 122 species composed as follows :—

A. 86 species *also found in South Spain*, whose further range is entirely "Palæarctic" and as follows :—

49 are widespread to the north and north-east over the "European" and/or "Siberian" sub-regions.

11 spread easterly to the Far-East over the "Mediterranean" and "Manchurian" sub-regions.

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* As represented by modern Tunisia, Algeria, and Marocco.

† All figures that follow must be taken as approximate only. Limitation of space forbids publication of the lists from which the figures have been compiled.

10 spread easterly to the Middle-East over the "Mediterranean" sub-region.

11 are found throughout the whole basin of the Mediterranean but not further east.

5 are found only in the western part of the Mediterranean basin.

Conversely, South Spain has only 7 species not found in Mauretania, viz.: *Cyanopica cyanus*, whose distribution is anomalous; the Long-tailed, Crested, and Marsh-Tits, whose centre of distribution is boreal; and the three mountain species, Snowfinch, Alpine Accentor, and Ring Ousel.

The other point of Europe nearest to (but ten times more distant, though perhaps of less ancient land connection with) Mauretania, viz., South Italy-Sicily, is less rich by ten of the above and has only one or two additional species, the Italian Sparrow and ? the Thick-billed Reed-Bunting (*E. pyrrhuloides*).

B. 36 species *not found in South Spain* whose range beyond Mauretania is as follows:—

20 spread easterly beyond Arabia.

9 spread east and south-easterly into N.N.E. Africa.

1 (*Francolinus bicalcaratus*) spreads to Tropical West Africa.

1 (the Shore-Lark) is widespread in Europe and Asia, save in the south-west and south-centre of the former Continent.

5 are confined to Mauretania.

Of the above (B), half are *desert* forms of Larks, Chats, Warblers, Finches, etc. of genera in about equal proportion Palæarctic and Ethiopian, and are presumably the specialized product of dominant forms in the borderland of the great stretch of desert from the Atlantic to North-west India, so that there remains only 18 species of as many genera, *i. e.*, 15 per cent. of the whole Mauretanian list, not distributed in simple extension within the Palæarctic Region.

Of these, the 5 species apparently confined to Mauretania are:—

Rhamphocorys clot-bey and *Chersophilus duponti*, two Desert Larks, the sole representatives of their genera.

Diplootocus moussieri, the only representative of its genus, which, however, is near those of the Palæarctic Redstarts and Chats.

Sylvia deserticola, a Warbler of the Mediterranean "*Melizophiline*" type.

Numida sabyi, one of the thoroughly "African" Guinea-fowls nearest to *N. meleagris*.

Of the remaining 13, all but two are reasonably accounted for by their wide ranging propensities or by transition from the eastward. The exceptions are *Otis arabs* and *Francolinus bicalcaratus*, which (even should they prove to differ racially from the African species), with the Guinea-fowl, are certainly the most exotic representatives of the Mauretanian Avifauna.

To sum up: even if we include the Tschagra, Bulbul, and Bush-babbler, it must be admitted that the genera and species of the Mauretanian Avifauna, with the so-formed 5 per cent. African infusion of species, are remarkably free from complex affinities when compared with those of many other bounding territories of the "Zoographical Regions"; and, as might perhaps be expected, exhibit nothing of the peculiarities of distribution attributed by Hooker to the plant-species of the Upper Great-Atlas.

The gap of south-west and south-central Europe between the Maroccan-Atlas and the rest of the vast area occupied by *Eremophila alpestris* is curious, but cannot be given more weight than that of an isolated exception.

Now let us review the subject in the light of *Racial* distribution.

Out of the 86 species common to Mauretania and South Spain, one half of the species are represented in Mauretania by different racial (or subspecific) forms, and if we eliminate from the other half all the species that preserve a common form over a very wide area, or practically the whole of their known range, there remain but three or four subspecific forms, Greenfinch, Linnet, Imperial Eagle, and perhaps Woodlark, common to the two territories.

Or, taking another view: out of the 42 species common to, but represented by different races in Mauretania and South Spain, 24 (only) are of race peculiar to the latter, the remaining 18 are all of races that extend far and/or wide on the European Continent, the most remarkable perhaps being the Magpie, Chaffinch, Nuthatch, Missel-Thrush, and Red-legged Partridge.

Viewed in either of the foregoing aspects, one cannot help observing the singular influence of the eight mile wide Straits of Gibraltar as a *subspecific* boundary between Europe and Marocco.

It now remains to examine distribution within the bounds of Mauretania itself; but here, even in the Bird "Class" we are confronted by the following serious obstacles:—

(*a*) The Riff, except at its extreme northern end near Tetuan is quite unknown.

(*b*) The western Great-Atlas and north-east branch of the Middle-Atlas, containing the dominant massif of the range, as well as the Marocco-Algerian confines, are quite unknown.

(*c*) The Desert-slopes of the Great-Atlas are practically unknown.

(*d*) The mountains of Western Algeria and the Saharan-Atlas Range have so far only been "skimmed," and the same may be said of all the remainder of Marocco except the Atlantic seaboard, the western extremity of the Great-Atlas, and the neighbourhood of Tangier.

But even these serious limitations scarcely obscure two outstanding distributional facts in Mauretania.

Firstly :—In to-day's physical map of Europe there is much that suggests the individuality distinguishing certain islands and parts of the Continent ; but in this compact-looking strip of Mauretania, surrounded by sea and desert, with a mountain-tract all along its Mediterranean seaboard, there seems little indicative of subdivision. On the contrary, there must be something in Marocco in addition to its present surface features, which gives it a distinct individuality apart from the remainder of "Little Africa." For example : of Mauretania's 122 Resident (non-Marine) species, nearly 30 per cent. either do not range over the whole territory, or are disposed in two or more subspecies throughout it as follows :—

*17 species in Tunisia and Algeria are not in Marocco.
7 species in Marocco are not in Tunisia and Algeria.
10 species have subspecies in Marocco that differ from the corresponding subspecies in Tunis and Algeria (sometimes more than one in either case).
1 species only (the Chaffinch) has a different racial division, viz. Marocco and Algeria/Tunis.

This may, in part, be explained by the following :—

(*a*) The Algero-Tunisian boundary is only a political one ; it is not indicated physically like the Algero-Maroccan, by the abrupt termination of the Great- and Middle-Atlas ranges, in the Ouad M'louya valley and its adjoining tracts of desert and steppe.

(*b*) Marocco's separation from the Sahara is abruptly defined by the Great-Atlas, whereas Algeria and Tunis both "peter out" into the Sahara in a succession of arid steppes and plateaux—a fact that accounts for their large number of desert forms.

(*c*) Algeria and Tunis lack Marocco's Atlantic seaboard which largely influences the climate and the passage of migratory birds.

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* This figure is likely to be reduced somewhat when the south slopes of the Great-Atlas are better known.

But I think that for the *full* explanation we must look to future exploration to provide the necessary material.

Secondly:—The racial distribution of species which presumably owe their origin and existence so far south to the high ground with its more northern climate is remarkable. To explain this phase I have attempted, in Plate XI. *a* & *b*, to show the present relations between altitude and forest-growth in Mauretania.

Plate XI. *a* is a map showing the mountain-tracts with special reference to those elevations which, given suitable climate and soil, favour real forest-growth. Plate XI. *b* shows (very roughly) the actual tracts of real forest-growth that now exist.

It is well known that among sedentary forest or woodland species, occurs much of that racial distribution for which no present reason seems to exist: witness, for instance, such near-home instances as the Irish Coal-tit and Jay; the Nuthatch's absence from the Isle of Wight and abundance in the New Forest; etc., etc. ... and being, *faute de mieux*, obliged to confine my remarks to the Class perhaps least well suited for the purpose, I have chosen the illustration afforded by the distribution of certain typical resident forest-birds in Mauretania.

If in the foregoing pages the reader has an impression of vast expanses of forest in Mauretania, this map should disillusion him: the term "well-forested" is always a comparative one. Even if, here, one may walk in a selected direction for days through forest-growth and tree-horizons, and though both history and recent observation suggest that in bygone centuries the Mauretanian forests were more extensive than now, the idea of comparing them in their past or present to the great subarctic and tropical forests of the world is absurd; indeed, it is highly improbable that Mauretania ever possessed forests comparable with those of Central Germany, Flanders, or even our own islands in early Roman days. Perhaps human agency, in this way, has slightly influenced racial distribution in Mauretania; but for myself I think it cannot have been drastic enough to be of much account, and that we must here seek the real explanation of all such problems in natural causes.

NOTE: I consider the much-quoted case of the Bermudan (introduced) Goldfinch is apt to mislead, and see in it no more of a guide to the rate of Variation in Nature than you get from a few generations of "fed" Wild-ducks.

The following table gives the variety of racial forms of the six selected typical woodland-species that inhabit the forest-areas in question:

RACES (Subspecific name abbreviated).

Locality.	*Jay.*	*Creeper.*	*Nuthatch.*	*Coal-tit.*	*Green Woodpecker.*	*Gt. Spotted Woodpecker.*
S. Spain	klein.	ultra.	?cæsia	vieræ	sharpei	hisp.
Riff	whit.	?	?	?	vaill.	maur.
Woods of the Plain (Forest of Mamora).	0	0	0	0	0	maur.
Middle-Atlas	œnops	maur.	atlas	atlas	vaill.	maur.
Great-Atlas	œnops	maur.	?	atlas	vaill.	maur.
Mts. of Tlemcen......	whit.	maur.	0	?	?vaill.	?
Algerian Tell	cerv.	maur.	0	ledou.	vaill.	numid.
Saharan Atlas (Djelfa forest)......	œnops	?maur.	0	?	?vaill.	?
Aurès Mts.	cerv.	maur.	0	ledou.	vaill	
Tunisian Mts..........	cerv.	maur.	0	ledou.	vaill.	numid.

Note:— 0 = Species does not exist.
? = ,, may exist.
?(name) = ,, does exist and is *probably* (name).

A satisfactory explanation of these distributional problems is beyond my powers, and indeed will scarcely be possible until much more material in all departments of Zoology is available, but in Plate XI. I have endeavoured to suggest certain lines of thought for the consideration of those interested in the subject.

Now that, thanks to French progress, Marocco has at last become more or less accessible to field-workers, may we not hope soon to have her placed on at least an equal footing in Natural Science with Tunisia and Algeria?

If Mauretania is free, by reason of the vast desert at its southern edge, from the complexities of distribution that occur in the Himalayas and other borderland areas of the Palæarctic Region, its Maroccan portion, with the comparatively narrow Alpine Range perched on the very brink of the Sahara, suggests that certain phases of distribution may here be capable of study in their "limit."

Even should it not be so, I can confidently assure any of my readers who wish to make a contribution to our knowledge of the "Systema naturæ" that they are not likely to regret a trip to Marocco.

For the benefit of those who will take up the subject, a double line has been placed in the margin of the text where allusion to conspicuous deficiencies in our knowledge of the birds is made.

The length of the foregoing remarks has reduced the space available for the customary catalogue with which to conclude my paper, and I find it necessary to curtail and abbreviate it, for which I owe an apology to my brother members. But my more detailed field-notes are at the disposal of any one who cares to ask for them: the specimens themselves are in the Natural History Museum, except for a few representatives of the rarer subspecies, which are at Tring; a trifling return for all the kind help given me by the late President of the B. O. C. and Dr. Hartert.

APPENDIX I.

NOTES ON ORNITHOLOGICAL BIBLIOGRAPHY OF MAROCCO.

A very complete Ornithological bibliography up to 1906 of the "Atlas territories" was published by Herman Schalow in

J. f. O. LIV. pp. 100 *et seq.*

The articles and works treating of Maroccan Ornithology that have helped me most are :—

Hartert, E.—"Die Vögel der paläarktischen Fauna."
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PART IV.

CATALOGUE OF BIRDS OBTAINED AND OBSERVED IN THE *MIDDLE-ATLAS* (*only*), WITH SOME FIELD-NOTES.

These notes are strictly confined to my own observations between 25 April and 17 July; winter observations are yet required before any species can be *proved* a Resident one.

The English name is that of the Species (since many racial forms have never yet been given English names, and some care in giving and using English names is desirable).

The order and nomenclature is that of Dr. Hartert's "Die Vögel der paläarktischen Fauna."

In the list are included as [absent] the names of certain Mauretanian species, which were looked out for, as possible, or likely to occur in the Middle-Atlas, but never found there.

Abbreviations used.

R. = Resident.
S. = Summer visitor.
M. = Migrant (passage).
[ ] = probably; every reason to suppose, but not yet *proved.*
abd. = abundant.
com. = common.
mod. = moderately common.
occ. = occasional.
r. = rare.
v. = very.
b. = breeds, breeding.
N. = nest.
9 ft. = 9 feet *above ground* (nest site).
e. = eggs (6 e. = 6 eggs).
y. = young in nest.
a. = addled egg.
d. = days. 6 d. { = 6 days *old* for young.
= 6 days *incubated* for eggs.
juv. ab. = young abroad (recently out of nest).
ad. = adult.
13.5 = (date) 13th May.
+ = of one family, or bird *and its* nest.
Coll. = specimens collected.
l. For. = lower Forest, 4700 to 5100 ft.
m. For. = middle Forest, 5100 to 5600 ft.
u. For. = upper Forest, 5600 to 6000 ft. (top).
l. m. For. = lower *and* middle Forest.
Plat. = Plateau.
base = base of "N. Slope" below the Forest including "Mamelons."

Corvus corax tingitanus Irby. (Raven.)

Coll. ♀ ad. from N. 5 e. 6 d. 8.5. [R.] abd., b. everywhere, N. trees and crags. Parties of six or more all through summer, and swarms up to 80 after June. Great variety of notes, deep quack like a hoarse duck, mocking laugh "wok-wok-wok," reminding of *Paradisea apoda*, &c.

Daw [absent].

Garrulus glandarius œnops Whit. (Jay.)
Coll. 4 ♂ ad. 26.4. to 17.6.; 2 ♀ juv. ab. 15.6. [R.] com.; b. l. m. u. For. Earliest juvs. ab. mid-June. Only nest found had young flown, 24.6. Against ilex trunk 9 feet, like N. of British Jay.

Pica pica mauretanica Malh. (Magpie.)
Coll. ♂ ad. parent + juv. ab. 25.5. [R.] com. but v. local; N. brushwood outskirts of For. Sev. family parties just ab. near Ito 4750 ft. Ad. also seen 13.6. in "Barrens." Cobalt eye-patch of juv. same as ad.

Pyrrhocorax pyrrhocorax (L.). (Red-billed Chough.)
Coll. juv. ab. 29.6. full grown. [R.] com., b. crags above 4000 ft., and in Crater on Plat. N. y. 7 d. and N. y. 14 d. 29.6.

ORIOLE [absent].

Sturnus unicolor Temm. (Spotless Starling.)
Coll. ♂ ad. 24.5. [R.] com. local; b. all altitudes except l. m. For. N. y. flown 17.5.; y. heard in N. cedars 20.6.

Coccothraustes coccothraustes buvryi Cab. (Hawfinch.)
Coll. 4 ♂ ad. 18.6. to 11.7.; 2 ♀ ad. 3.7.; 3 juv. ab. 5.7., 11.7.; 2 y. 5 d. 26.6. [R.] abd.; b. l. m. For. N. 2 y. 5 d. 26.6.; hor. bough top ilex 40 feet. Nest massive because framed with lichen, like a nest of Missel-Thrush; for same reason v. difficult to detect. Fam. parties, swarming at wild cherries all July; parents plucking fruit and feeding young; whole berries.

GREENFINCH [absent].

Acanthis carduelis africanus. (Goldfinch.)
Coll. ♂ ad. + ♀ ad. (pair) 3.6. [R.] abd. up to 6000 ft.; e. up to July.

Acanthis cannabina mediterranea (Tschusi). (Linnet.)
Coll. ♂ ad. 17.5.; ♂ ad., ♀ ad. 18.5. ? R. com. up to 4700 ft.; b. base. b. early; juv. ab. before 25.4. Sev. this year's hatched-out nests; scrub juniper, 3.5. Ad. and juv. frequented spot independently, but no second nests made.

CROSSBILL [absent]; no pines.

Fringilla cœlebs africana Levaill. (Chaffinch.)
Coll. 2 ♂ ad. 2.5., 4.7.; ♀ ad. 14.5.; ♂ juv. 2.7.; ♀ juv. 4.7. [R.] abd.; b. l. m. u. For. b. late; curious, flocks up to 40,

mixed sexes, up to mid-May. Earliest eggs 2nd week May. Earliest juvs. ab. not till end June. Song of ♂ same style as British, trifle less musical; but call-note "spink-spink" especially in ♀, no timbre, more like double-*chirp* of a Sparrow.

|| Is "*kœnigi*" distinct form?

Serinus serinus serinus L. (Serin.)

Coll. 2 ♂ ad. 15.5., 20.5. [R.] mod.; b. u. For.

Petronia petronia (? **barbara** Erl.). (Rock-Sparrow.)

Coll. ♂ ad. 13.6. v. worn, had bred. ? R. mod., Plat. edge "Barrens" among cedars. Only spec. obt. is much suffused below with pale snuff-colour, esp. throat either side yellow spot, and leg-feathers right up to root. But suspect volcanic-dust discoloration.

|| Fresh plumage examples *wanted*.

Small (prob. fam.) parties, June–July. Sev. also seen above Ain Leuh 27.4.

Passer domestica (? race). (House-Sparrow.)

[R.] com., b. up to Azrou. No Coll.; looked like *domestica*.

Emberiza calandra calandra L. (Corn-Bunting.)

Absent from Middle-Atlas. (? R. com. Tigrigra Valley, where N. 6 e. 4 d. 29.5, and abd. lower alts.)

Emberiza cirlus L. (Cirl Bunting.)

Coll. ♂ ad. + ♀ ad. + N. 5 e. 2 d. 13.5. N. 4 y. 15 d. 26.6. [R.] r. base and l. For.

Emberiza cia cia L. (Rock-Bunting.)

[R.] r. base. Twice seen, close range; not obtd.

CALANDRA LARK [absent].

SHORT-TOED LARK [absent].

Galerida cristata riggenbachi Hart. (Crested Lark.)

Coll. 2 ♂ ad. 11.5., 28.5.; ♀ ad. laying e. 28.5. [R.] com. base and lower alts.; looked same Race all way up from Casablanca. Absent from Plat.

THECKLÆ CRESTED LARK [absent].

Lullula arborea (? **harterti** Hilgert). (Wood-Lark.)

Coll. 4 ♂ ad. 27.4., 15.5.; ♀ ad. 20.5.; 2 juv. ab. 4.6., 13.6.; N. 2 y. 14 d. + 1 e. a. 5.5. [R.] abd. 4600 ft. to "Barrens"; not on Plat. or *in* For. N. 5 e. 8 d. 4.6.

Fresh plū. specns. wanted to determine race; general colour depends much on feather-borders; the dark centres are similar in all races.

Song characteristic, ubiquitous; not entirely ceased by July.

Alauda arvensis (? race). (Skylark.)

Coll. 5 ♂ ad. 23.5. to 29.6.; ♀ ad. 12.6. (laying e.); 3 juv. ab. 14.6., 28.6. ? R. abd. Plat. N. 4 e. 4 d. 24.5.; N. 4 e. 5 d. 13.6.

A Skylark with attenuate bill and fine crop-flecks like *harterti*, but much blacker above, and with darker ear-coverts. Whole plumage suffused delicate pink-buff tinge, specially noticeable on the light underside. This is not due to stain and seems peculiar. Believe will prove same as breeding race of S. Spain and Portugal sierras (judging from two v. poor but only specns. available here), but does not at all agree with *description* in Orn. Monatsb. 1913 of *A. a. sierræ* Weigold, which breeds in Sa. Nevada, 6000–9000 ft. Song and habits as British Skylark. Nest and eggs ditto. Av. 8 e. 22·1 mm. × 16·4 mm.

Wanted, fresh plumaged specns. that breed Atlas and Iberian Sierras.

Eremophila alpestris (? **atlas** Whit.). (Shore-Lark.)

Coll. 8 ♂ ad., 4 ♀ ad. 23.5. to 10.7.; ♂ ad. + ♀ ad. + N., 2 e. 2 d. 9.6.; 1 juv. ab. 12.6. ? R. com. Plat.

Almost certainly *atlas* (a specn. sent to Sicily to compare with type).

N. of 9.6. prob. second laying. My first acq. with Plateau, 23.5; shot ♀ carrying "stonefly," obv. to young. From bare breast, think ♂ shares incub. N. on a small earthy flat; few stones; had held water too late in year to grow herbage. A detached root of dwarf cistus had here become partially embedded in the floor; under it the *birds* had apparently made an earth-mound, with a crater in it to contain the fairly substantial nest (of dry wiry pieces grass, rootlets and vegetable down, with shallow cup) in it, and added a front doorstep of some 50 pebbles, like a Blackchat. Whole site, root-canopy, and all, v. like that of an *Alæmon alaudipes* found P. Sudan, 1914. Birds always near, or on similar bare flats, often v. stony. Never heard one utter a sound of any sort or make any courting display. Young ab. always hid in long grass after first rise with parents; 3 apparently max. brood, perhaps only 2.

2 e. of 9.6.=full clutch, *vide* ♀ ovary. See Plate X. *a* of N. photo taken on 31.5. when building; note absence of pebbles, added later. e. typical of *E. alpestris*; long blunt ovals, 25 mm. × 16·7 mm. and 25 mm. × 16 mm.

Anthus campestris campestris (L.). (Tawny Pipit.)

Coll. ♂ ad. 17.5.; ♀ ad.+N. 5 e. 4 d. 26.6.; y. 12 d. 22.5. S. mod. base to Plat. The y. of 22.5. brought me by native near Timoudit; curiously earlier than any breeding at base near Azrou. Alarm-note like small pipe of Golden Plover—brutes! . . . (but only to the nest-hunter). At base arrived about 4.5.

Motacilla boarula boarula L. (Grey Wagtail.)

Coll. ♀ ad. 29.6. ?R. r. base. Single specn. obtd. at base of Azrou Gully. Breeding over. Sure to have bred not far off. ♀ ad. seen Ain-Leuh cascade, 28.4.; prob. breeding there.

Certhia brachydactyla mauretanica With. (Creeper.)

Coll. 2 ♂ ad., 2 ♀ ad., 25.4. to 19.16.; ♂ ad.+N. 3 y. 10 d. +1 e. a. 8.7.; ♀ ad.+N. 5 e. 3 d. 11.6. [R.] abd. l. m. u. For. Late breeder; no juvs. ab. before July. N. never found behind semi-detached bark, but in holes rotten ilex boughs; vertical entrance in both the above nests.

WALL CREEPER [absent].

Sitta europæa atlas Lynes, Bull. B. O. C. Nov. 1919. (Atlas Nuthatch.)

Coll. TYPES, ♂ ad. 3.5.; ♀ ad. 19.5.; juv. 7.7.; and 2 ♂ ad. 2 ♀ ad. 25.4. to 27.6.; ♂ ad.+ ♀ ad.+N. 7 e. 3 d. 7.5.; 3 juv. ab. 3.7., 7.7. N. 6 e. 6 d. 19.5. (Plate IX. *a*); N. 6 y. 2 d. 19.5. [R.] abd. l. m. u. For. New subsp. v. similar to *cæsia* but bill conspic. more slender, attenuate, smaller base, and feet and claws rather weaker. Wing of 4 ♂ ad. average 87 mm., rather longer than *cæsia*.

Colour below inclined to paleness, but *wanted* fresh plu. specns. to see if constantly more so than other races.

Not minor, which has short thick bill. N. in hole ilex 4′ to 20′, moss, then dry leaves of ilex and hawthorn; lined few ilex bark-flakes; entrance mud-cemented like British Nuthatch. e. like British Nuthatch; 13 e. av. 20·3 mm. × 14·8 mm. ♀ 25.4. laying eggs; prob. earliest. Very noisy: loud, continuous "chēēp-chēēp . . ." and "chich-e-wēē—chich-e-wēē . . .," but no trilling like British Nuthatch.

Parus major excelsus Buvry. (Great-Tit.)

Coll. 2 ♂ ad. 20.4., 26.4.; ♂ ad.+ ♀ ad.+N. 10 e. 0 d. 19.5.; juv. ♂ 14.7. [R.] abd. l. m. For.; mod. u. For. Habits, N. e., much like British Great-Tit. Looks as if specns. from Middle- and Great-Atlas run larger than Marocco Plain birds, but quite same colour. Similarly with Florentine Mt. *P. major.* Amount of white on outer tail-fea. v. variable.

Parus cæruleus ultramarinus Bp. (Blue-Tit.)

Coll. ♀ ad. + N. 7 e. 4 d. 26.5.; 2 juv. ab. 2.7. [R.] abd. l. m. For.; mod. u. For. Habits, N. e., much like British Blue-Tit. Many N. found. (Also N. 10 e. 2 d. + ♀ ad. 20.4. For. of Mamora.)

Parus ater atlas Meade-Waldo. (Coal-Tit.)

Coll. 6 ♂ ad. 25.4. to 27.6.; ♀ ad. 20.6.; 1 juv. ab. 3.7.; ♀ ad. laying e. 2.5.; ♂ ad. + ♀ ad. + N. 3 e. 6 d. 15.6.; ♂ ad. + 6 y. 15 d. 15.6. [R.] abd. m. u. For.; mod. l. For. Earliest e. prob. last week May. Loud distinctive "call-song"—"tsi-chēēp—tsi-chēēp—tsi-chēēp......" and "its-so-chēēp —its-so-chēēp.. ...". The five specns. of 20.6. from large flock 40 or more adults, worn plu., sex organs quite small; apparently non-breeders? 4 N. found, all *in* the ground, entrance-hole at the side of a stone or fallen log; other N. not found earlier in season because I had thought the bird dropped the nesting material in its beak, on the ground, on account of being watched. N. solid base of fine dry rootlets, lined much fur of ape, sheep, etc. Eggs like British Coal-Tit, but size larger and ground white tinged faint yellow-pink. 1 e. = 17·8 mm. × 13 mm.

Regulus ignicapillus ignicapillus (Temm.). (Firecrest.)

Coll. ad. ♂ 3.5.; ad. ♀ 8.7. (with brood ab.). [R.] com. l. m. u. For. Rather late breeder, first juvs. ab. not until about 21.6. 1 N. ilex 15 ft., 1 N. cedar sapling, 10 ft.

Lanius senator (? race). (Woodchat.)

S. r. Barrens—*not* For. Only twice seen; likely looking place for N. (but com. in brushwood near Ito).

Muscicapa striata striata (Pall.). (Spotted Flycatcher.)

Coll. ♂ ad. 6.5.; ♀ ad. 9.7.; ♂ ad. + N. 3 e. 2 d. 28.6.; N. 3 e. 3d. 19.6. S. abd. l. m. u. For. Arrived first week May.

Muscicapa atricapilla speculigera Bp. (Pied Flycatcher.)

Coll. ♂ ad. 7.5.; ♂ ad. + N. 5 e. 0 d. 27.5; ♂ ad. + N. 5 e. 10 d. 8.6.; ♀ ad. + N. 4 e. infertile, 21.6. S. abd. l. m. For., mod. u. For. Arrived before Spotted Flyc. First N. 5 e. 0 d. 27.5. Second N. 6 e. 8 d. 4.6., etc. N. in holes, ilex, 10–30 ft. Dry grass, finer lining ditto, no hairs or feathers, slight, e. like *atricapilla* [6 = max. clutch]. Noisy, notes loud and varied, one reminding of Bee-eater; another, plaintive "pipe-song" something like rich Robin song, seemed quite diff. to British Pied Flyc. Racial characters very clear.

Phylloscopus bonellii bonellii (Vieill.). (Bonelli's Warbler.)

Coll. 3 ♂ ad. 3.5. to 16.5.; ♀ ad. + N. 5 e. 2 d. 1.6,; N. 5 e. 1 d. 27.5. S. abd. l. m. For.; mod. u. For. Juv. ab. not till near July. Can watch ♀ on to nest like Wood-Wren, note and all (call-note mixture of Wood- and Willow-Wren).

WOOD-WREN [absent S.]; but one, prob. *sibilatrix*, M. seen 25.4. l. For.

Phylloscopus trochilus trochilus (L.). (Willow-Wren.)

Coll. ♀ ad. 6.5.; l. For. M. r. In beautiful fresh plu.

Hippolais polyglotta. (Melodious Warbler.)

Coll. ♂ ad. 16.5.; ♂ ad. + juv. ab. 24.6.; N. 4 e. 3 d. 7.6.; N. 3 e. 3 d. 23.6. and others. S. abd. base to Plat. edge where bushes. Arrived about 3.5.

ORPHEAN WARBLER [absent].

Sylvia atricapilla atricapilla (L.). (Blackcap.)

Coll. 2 ♂ ad. 10.6.; ad. ♀ + juv. ab. 8.7.; N. 3 e. 0 d. 8.6. S. mod. l. m. For. Arrived first week May. Like many southern individuals, these incline to dark tint, *vide* Hart. Vög. Pal.

Sylvia communis communis Lath. (Whitethroat.)

Coll. ♂ ad. 15.5.; ♀ ad. + N. 5 e. 2 d. 29.5.; juv. ab. 5.7. S. com. all alts. up to Barrens. Other N. found. Arrived first week May.

Sylvia conspicillata. (Spectacled Warbler.)

All through May watched a ♂ at juniper scrub on side of an Azrou mamelon, singing and doing best to breed without a mate! Come June he gave it up and disappeared. Only one seen.

Sylvia cantillans inornata Temm. (Subalpine Warbler.)

Coll. ♂ ad., ♀ ad. 10.5.; ♀ ad. 25.6.; ♂ ad. + juv. ab. 18.6.; N. 4 e. 2 d. 7.6.; N. 4 e. 7 d. 23.6. S. mod. base. Arrived about 1.5. Eggs handsome red blotch and spot type. The white moustache of ♂ almost absent is a noticeable field character.

SYLVIA MELANOCEPHALA }
,, SARDA } all [absent].
,, DESERTICOLA }

Turdus viscivorus deichleri Erl. (Missel-Thrush.)

Coll. ♀ ad. 27.4., would have laid first of 4 or 5 e. on 28.4; 2 juv. ab. 29.5.; 2 juv. ab. 1.6.; fam. parties; ♂ ad. 1.7. N. 4 y. 17 d. 4.7. [R.] Com. l. m. u. For. Never saw one that in the field did not look much paler and *greyer* than British Missel-Thrush. In the juvs. ab., the topside, esp. rump, is much more grey-green olivaceous than are even the least "brown" Europeans examined. More silent than Brit. bird both in song and alarm. First juvs. ab. about 15.5.

Turdus merula mauretanica Hart. (Blackbird.)

Coll. 3 ♂ ad. 8.5. to 8.6.; 3 ♀ ad. 3.6. to 14.7.; 7 juv. ab. 3.7. to 12.7.; N. 3 e. 3 d. 20.5.; N. 1 e. 0 d. 5.6.; N. 2 y. 7 d. + 1 e. a. 5.7.; N. 2 y. 15 d. 11.7. [R.] com. l. m. u. For. Rather late breeder, laying not till second week in May. Song very loud and sweet. Juv. plu. in two phases, "grey" and "brown" in each sex.

Monticola solitarius solitarius (L.). (Blue Rock-Thrush.)

Coll. ♂ ad. 19.5. ? R. Com. locally, *not* For. com. Timoudit, but r. Azrou.

Saxicola œnanthe seebohmi Dixon. (Seebohm's Wheatear.)

Coll. 3 ♂ ad. 24.5., 30.5.; 4 ♀ ad. 22.5. to 14.6.; 4 juv. ab. 29.6.; ♀ ad. + N. 5 e. 7 d. 14.6.; N. 4 y. 12 d. 30.5. (Plate IX. *b*); juv. N. 19.6. N. 6 e. 0 d. 25.6. ? S. abd. Plat. All 3 nests under large, base-embedded stones, entrance track through herbage noticeable. N. *œnanthe* like, chiefly rootlets, a little dry grass and wool, and few feathers woven in, substantial. e. uniform medium blue or with 6–15 tiny rusty spots. Clutch 5 e. av. 20·8 mm. × 15·6 mm.; 1 e. spotted. Clutch 6 e. av. 21·0 mm. × 16·7 mm.; 2 e. spotted. Habits and song much same *œnanthe*. One ♀ ad. *laying e.* 30.5. partial assumption of ♂ ad. plumage, even blackish-brown throat. Unusually fat; ? possible connection between fat, vigour, and ♂-like plu. Tring has a ♂ ad. inclining to ♀ ad. plu. More specns. and study wanted here.

Saxicola hispanica hispanica (L.).

Coll. (*Black-throated Wheatear*) ♂ ad. + ♀ ad. + N. 5 e. 0d. 18.5. S. r. base (but com. Tigrigra valley). (*Black-eared Wheatear*), only one ♂ ad. seen base during last week May; then ? finding no mate, disappeared.

Saxicola leucura syenitica Heugl. (Blackchat.)

Coll. ♂ ad. (with juv. ab.) 2.6., ♀ ad. + N. 4 e. 1 d. 31.5.; 2 juv. ab. 10.6. [R.] mod. base. N. 5 y. 4 d. 10.5.; N. 4 y. 4 d. + 1 e. a. 14.5. Racial characters quite clear, esp. broad tail-band.

All other species of Wheatear [absent].

Stonechat [absent].

Phœnicurus phœnicurus algeriensis Kleinsch. (Redstart.)

Coll. ♀ ad. 10.6.; ♂ ad. + N. 6 e. 7 d. 10.6. S. abd. l. m. u. For. First N. 6 e. 0 d. 24.5. Racial character of wing quite clear.

Diplootocus moussieri (Olphe-Gaillard). (Moussier's Redstart.)

Coll. ♂ ad. + ♀ ad. + N. 4 e. 7 d. 13.5. [R.] com. base and Barrens. N. in cleft boulders; e. immaculate white, av. 18·9 mm. × 14·6 mm. N. & e. like Blackstart's.

Luscinia megarhynchos megarhynchos Brehm. (Nightingale.)

Coll. juv. ab. 3.7.; juv. ab. 11.7. S. local, l. For. Arr. early May. Sev. breeding nowhere near water.

Erithacus rubecula atlas Lynes, Bull. B. O. C. Nov. 1919. (Atlas Robin.)

Coll. 4 ♂ ad. 25.4. to 12.7.; ♀ ad. 10.7.; 2 juv. ab. 29.6., 8·7. [R.] com. l. m. u. For. N. 5 e. 2 d. 9.5.; N. 4 e. 4 d. 9.5.; N. 3 e. 6 d. 1.7. Near *rubecula*, especially some southern examples but differs from all, in topside, *including rump*, being dark earthy olive-green, lacking all rufous tinge. One of the big-billed forms. Looks inclined to nearly lack light wing-band altogether, but fresh plu. specns. wanted to determine. Habits, N., e. much same British Robin.

Troglodytes troglodytes kabylorum Hart. (Wren.)

Coll. 2 ad., ♂ 27.4., 20.5.; juv. ab. 25.6.; ♂ ad. + ♀ ad. + N. 4 e. 6 d. 1.6. Earliest N. 4 e. 3 d. 2.5.; last N. 5 e. 1 d. 10.6. R.

com. l. m. For. N. e. habits much like British Wren. Many "cock's" nests. In *kabylorum* examples from high alts. appear to be rather more "barred" below.

DIPPER [absent].

Chelidon rustica rustica (L.). (Swallow.)

? S. com. b. Azrou. Some N. inside native *living* rooms, as in China. First e. Azrou about 10.5.

HOUSE-MARTIN, SAND-MARTIN, CRAG-MARTIN [absent].

Apus melba. (Alpine Swift.)

? S. com. local Plat. Apparently breeding Timoudit and in a "Crater." Swarms at Meknez, breeding in holes of city walls, 1.5.

Apus apus apus (L.). (Swift.)

Coll. ♂ ad. 24.5. Believe only autumn visitor to Middle-Atlas, after breeding in plains. First lots seen u. For. 19.5. flying round cedar tops. By 10.7. Swifts swarmed over Plat.

APUS MURINUS and APUS AFFINIS [absent].

Caprimulgus europæus meridionalis Hart. (Nightjar.)

Coll. ♀ ad. 9.5.; ♂ ad. prob. of N. 2 e. 2 d. 22.6.; ♀ ad. + 1 e. 1 d. 26.6. S. mod. base, b. just below For. *only*. N. 2 e. av. 29·7 mm. × 21·5 mm.; abnormal, white; no undershell markings; few dark surface blotches. N. 1 e. 28·3 mm. × 20·3 mm.; normal but light ground col. Arrived about 9.5.

RED-NECKED NIGHTJAR [absent].

BEE-EATER [absent].

Upupa epops. (Hoopoe.)

[S.] mod. Barrens. Evid. N. in cedars. No juvs. ab. up to 21.6.

Coracias garrulus garrulus L. (Roller.)

[S.] mod. l. m. u. For. clearings. N. holes trees; y. still in N. being fed 9.7. (Swarms breed in city walls Meknez.)

KINGFISHER [absent].

Picus vaillanti (Malh.). (Le Vaillant's Green Woodpecker.)

Coll. 2 ad. ♀ 27.4., 22.6.; ♂ ad. 8.6.; juv. N. 11.6.; juv. ab. 19.6. [R.] abd. l. m. u. For. Many y. hatched by 1.6.

Dryobates major mauretanus (Brehm). (Great Spotted Woodpecker.)

Coll. 2 ♂ ad. 27.4., 27.5.; 2 ♀ ad. 10.5., 6.6. [R.] abd. l. m. u. For.; b. rather later than Green W.; e. not till mid-May.

Lesser Spotted Woodpecker [absent].

Wryneck [absent].

Cuculus canorus. (Cuckow.)

M. r. 9.5. one ♂ called throughout day; species never seen or heard again.

Eagle Owl [no trace].

Otus scops scops. (Scops Owl.)

Coll. ♂ ad. 4.7., m. For. Only occasion seen. Sex organs breeding over.

Athene noctua glaux (Sav.). (Little Owl.)

Coll. ad. ♂ 23.6.; ad. ♂ + ad. ♀ 3.7.; ad. ♂ of 3.7., freak, pale var. S. com. base.

Strix ? sp. (Wood Owl.)

Twice seen in For., not obtained.

Falco peregrinus. (Peregrine Falcon.)

Apparently breeding in cliffs at base, 14.5.

Falco subbuteo jugurtha Hart. & Neum. (Hobby.)

Coll. 2 ♂ ad. 11.6., 12.6.; ♀ ad. laying e., 25.6 (1 soft in uterus, 2 more to come in ovary). ? S. mod. u. l. edges For.

Falco tinnunculus. (Kestrel.)

? R. com. above and below F. Certainly b., but no specimens obtained.

Falco naumanni. (Lesser Kestrel.)

Absent from Middle-Atlas, though swarming in cities of Plains and El Hajeb.

Aquila chrysaëtos occidentalis. (Golden Eagle.)

Coll. ♀ juv. 2.7.; circa 70 days age. Fully fledged sitting alongside nest at top of large cedar m. For. (Plate IV. *b*). N. under obs. since 3.5. when held 2 y. in down. The only Golden Eagles in the district.

(No other *Aquila* sp. seen.)

Buteo ferox cirtensis. (Rufous Buzzard.)

Coll. ♀ ad. + N. 1 e. 3 d. 14.5, full clutch fide ovary ; ♀ ad. 29.5., light plu. young bird moulting into full ad. plu., ovary quite small. ? Freak since size only = small ♂ (Hartert). ? S. mod. l. m. For. – r. u. For. N. ilex bough, 15 feet.

? Belong to this sp., certain buzzard-flighted birds occ. seen on wing looking like small square-tailed Neophron—so black and white *below*—but mottled topside.

Accipiter nisus punicus Erl. (Sparrow Hawk.)

Coll. ♂ ad. 20.5. ; testes small. ? R. mod. l. m. For. Freq. seen, but never found N. or y.

Melierax canorus (Chanting Goshawk) [absent].

Milvus milvus. (Red Kite.)

? R. mod. ; l. m. u. For., also seen Plat. N. 2 y., sitting outside, 20. 6.

Milvus migrans migrans (Bodd.). (Black Kite.)

? S. ab. everywhere. N. 2 e. 5 d. 15.5. ; ♀ sitting on. e. 3.5. ; juv. ab. 10.6. A large proportion of the Black Kites seen were certainly not breeding.

Elanus cæruleus. (Black-winged Kite.) ? absent.

Thought to be seen once.

Circaëtus gallicus. (Snake-Eagle.)

? R. occ. ; seen everywhere except Plat.

Gypaëtus barbatus. (Lammergeier.)

Constantly seen over u. F. ; occ. at base after food. Prob. b. in For. crest crags to westward ; locality inaccessible owing to hostile Berbers.

Neophron percnopterus. (Egyptian Vulture.)

? S. com. b. cliffs all alts. N. 2 e. 2 d. 8.5.

Gyps fulvus fulvus. (Griffon Vulture.)

Not b. Middle-Atlas but b. cliffs foot-hills, near Ito, where mod. com. summer. Saw skin shot Azrou winter.

Aegypius monachus. (Black Vulture.)

Nearly sure saw one fly over u. For. early in May.

Ciconia ciconia. (Stork.)

S. com. base (no higher). Swarms b. cities of Plain and collect Valley Tigrigra July.

Comatibis eremita. (Bald Ibis.)
Coll. ad. (head only) 24.5. ? R. com. base and Plat.; b. cliffs.

(All Heron Tribe absent.)

Casarca ferruginea (Pall.). (Sheld-duck.)
2 ad. shot 29.6, lake on Plat. where com. Eaten (no! uneatable). Sex organs not examined. May have been breeding in hills near by, but all ad. and in twos!

Colymbus ruficollis. (Dabchick.)
|| Sev. lake on Plat. 29.6. ? b.

Columba œnas L. (Stock Dove.)
Coll. 2 ♀ ad. 22.5.; by ovaries only *going to* breed! N. 2 e. 5 d. 8.7., u. For. [R.] abd. everywhere; fed in flocks in valley about 6 A.M. and 3 P.M.

Columba palumbus palumbus L. (Wood-Pigeon.)
Coll. ♂ ad. 25.4. N. 2 e. 7 d. 29.5. [R.] abd. l. m. u. For.; fed in flocks in valley about 6 A.M. and 3 P.M.

|| **Columba livia** (? race). (Rock-Pigeon.)
[R.] only seen in a cave near Azrou; few pairs; had bred; egg-shells floor of cave, 14.7.

Streptopelia turtur turtur. (Turtle Dove.)
Coll. ♀ ad. 24.6.; 2nd e. in oviduct. S. abd. base and l. For. N. 2 e. 4 d. 29.5. Arrived early May.

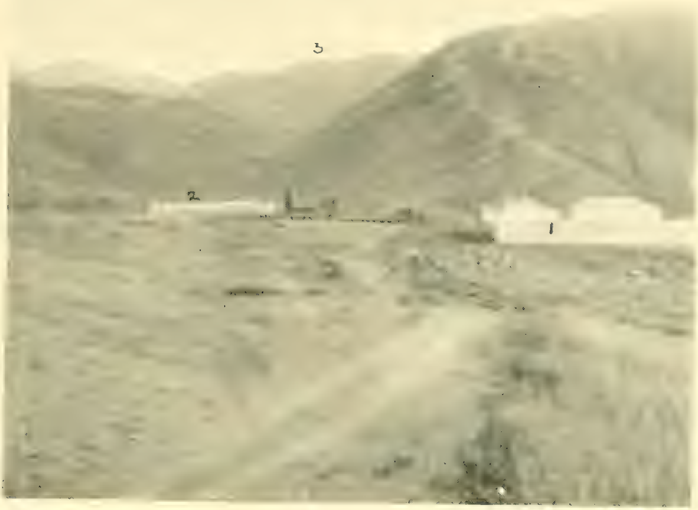
Burhinus œdicnemus. (Stone-Curlew.)
Not b. Middle-Atlas (a pair, ♀ laying e. [fide ovary], shot 23.5. in Tigrigra Valley, but r. there).

Otis tetrax. (Lesser Bustard.)
Not b. Middle-Atlas, but b. plains, then come up to Plat. to moult; small flocks first appeared Plat. 2nd week June. Sev. shot.

Fulica atra atra L. (Coot.)
|| 1 ad, shot 29.6, lake on Plat. ? b. there.

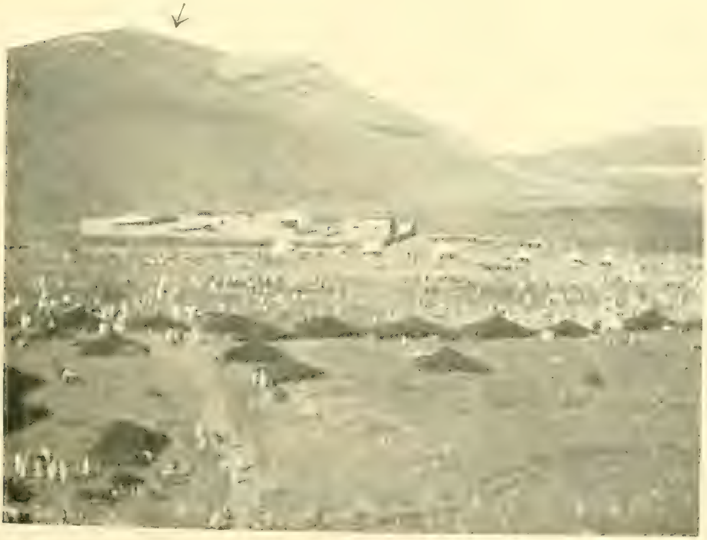
Coturnix coturnix coturnix. (Quail.)
Coll. ♂ ad. 24.5. S. com. b. Plateau (and Valley of Tigrigra).

Alectoris a. petrosa. (Barbary Partridge.)
R. abd. base. N. 13 e. deserted about 14 d. 17.5. Broods of cheepers just able to fly a little, first came in evidence last week June.



A

Azrou (4150 ft.) general view looking South towards the Middle-Atlas, whose crests (3) bound the horizon. Military Camp (2), "Woods and Forests Department" Camp (1).



B

At the foot of one of the "Mamelons" at the Northern base of the Middle-Atlas (4150 ft.)
Peace Day celebrations at Azrou.

A

In the lower (Ilex) Forest on the North Slope of the Middle-Atlas (4750 ft.)
Nest of Raven (Corius c. tingitanus) at Ilex top.
Five young, half-grown, Mid May.

B

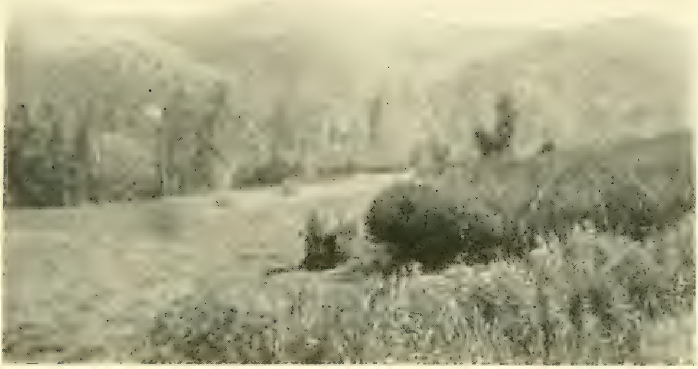
On the "North Slope" of the Middle-Atlas looking down a gorge into the Valley of the Ouad Tigrigra.
Nest of Golden Eagle (Aquila c. occidentalis) at the summit of Cedar (5250 ft.)

A

Ascent to the "Home col" above Azrou, view at 5500 ft. An open gully, rocky and stony with dolomitic limestone (of dazzling brilliancy) in contrast with the surrounding forest.

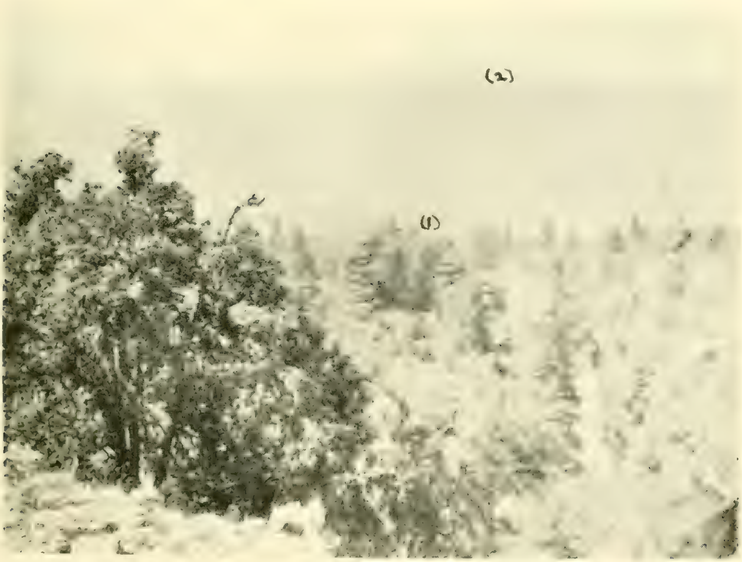
B

In the Upper forest of the Middle-Atlas (5700 ft.)



A

A general view of the Upper forest, principally Cedars. Taken at about 5600 ft.



B

General view of the Forest on the North slope of the Middle-Atlas looking (North) down into the Tigrigra Valley (1) and across it the Plateau of El Hajeb (2) which here forms the Southern horizon.
Taken from Crest of North Slope at 5700 ft.

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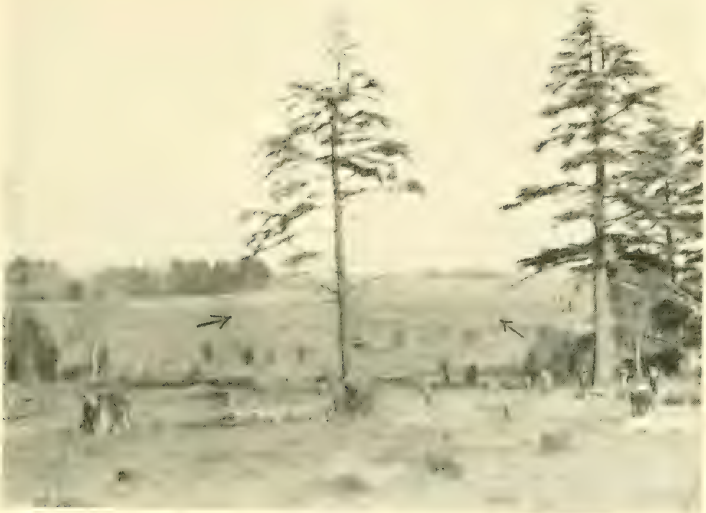
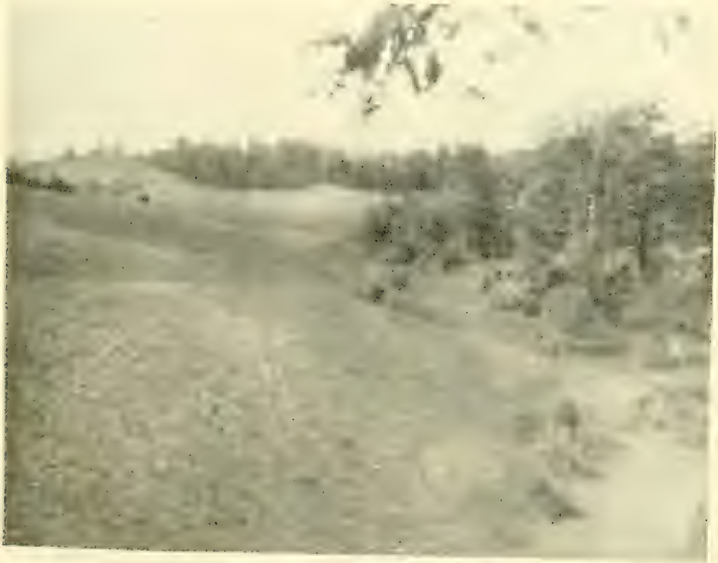


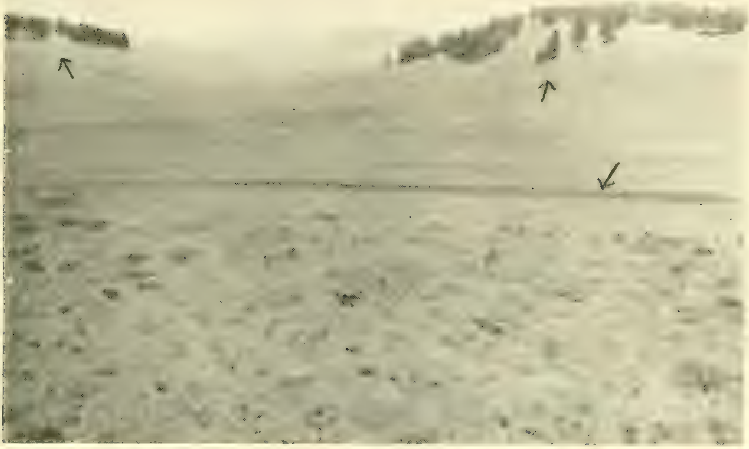
A

The "Barrens," i.e. one of the two types of border-zone between the Forest and the "Plateau." Middle-Atlas (5700 ft.)



B

The "Crest-mounds," i.e. the other type of border zone, between the Forest and the "Plateau." Middle-Atlas (5700 ft.)

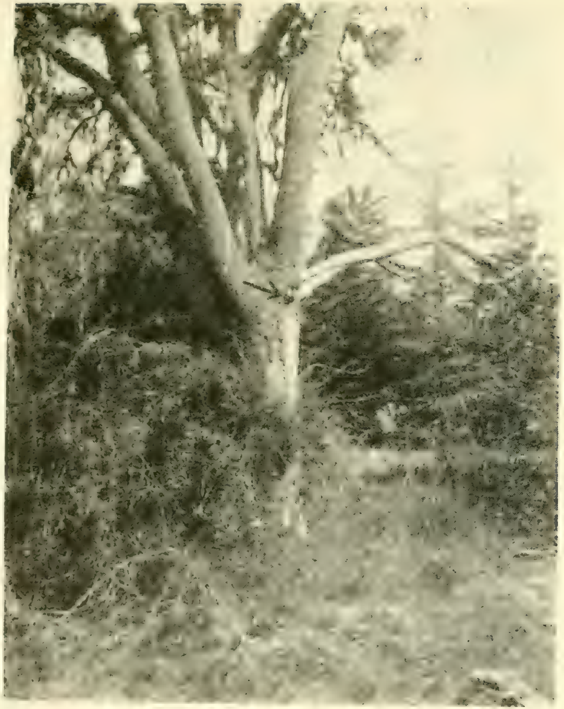


A

On the "Plateau" of the Middle-Atlas (6200 ft.), showing new Road (in construction) and two cedar-crowned "Volcanic kopjes" at the Northern part of the Plateau.

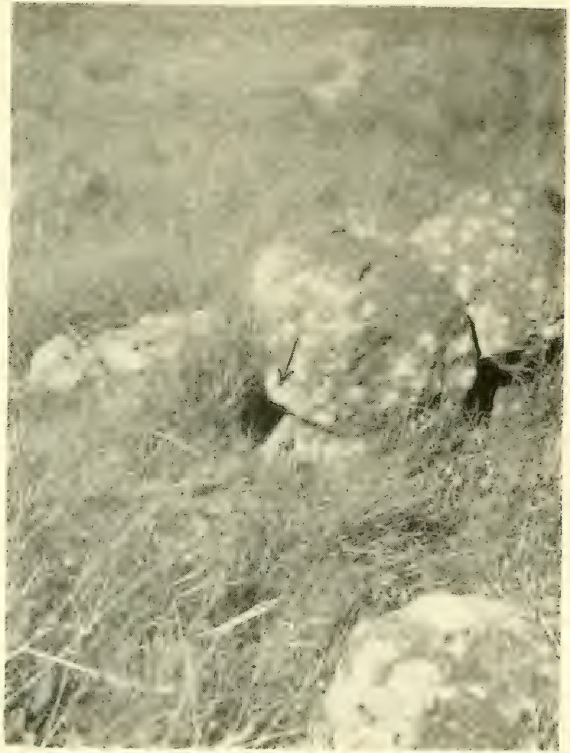
B

On the "Plateau" of the Middle-Atlas (6200 ft.).
The "Route" across the Plateau at Jebel Hebbri Camp, looking South.



A

Nesting site of Atlas Nuthatch (Sitta c. atlas).
Six fresh eggs, May 19.
Upper forest at Middle-Atlas (5600 ft) (entrance hole
under the fungus).



B

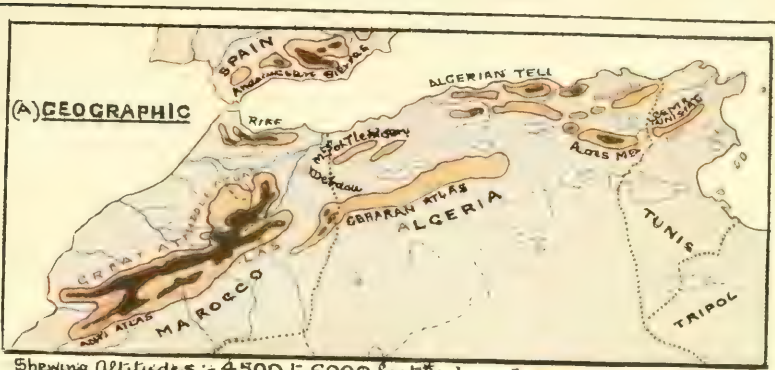
Entrance to nest of Seebohm's wheatear (Saxicola œ
seebohmi), four young, three-quarters grown, May 30.
Plateau of Middle-Atlas (6200 ft.)

Nest of Atlas Shore-Lark (Eremophila a. atlas), two eggs, June 9.
Plateau of Middle-Atlas (6200 ft.)

Forest of Mamora near Kinitra. (Note its open-gladed nature, of quite different character to that of the Middle-Atlas forest. The trees too, are mainly Cork and Oak, not Ilex).

MAURETANIA

SOME CONSIDERATIONS AFFECTING THE DISTRIBUTION OF CERTAIN OF ITS PRESENT FORMS OF LIFE


(A) GEOGRAPHIC
SPAIN
Andalucian Sierras
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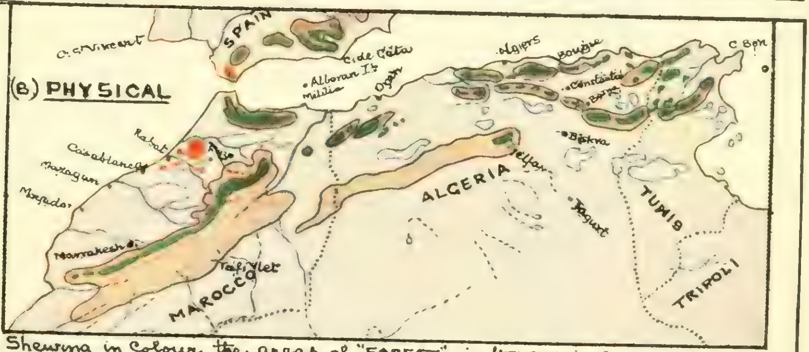
TUNIS
GREAT ATLAS
MIDDLE ATLAS
MAROCCO
ANTI ATLAS
TRIPOL

Shewing Altitudes :- 4500 to 6000 feet* coloured 🟨
above 6000 feet " ■
*In Mauretania the "Big-Forest" lies between these altitudes


(B) PHYSICAL
SPAIN
C. St. Vincent
C. de Gata
Alboran Is.
Melilla
Oran
Algiers
Bougie
Constantine
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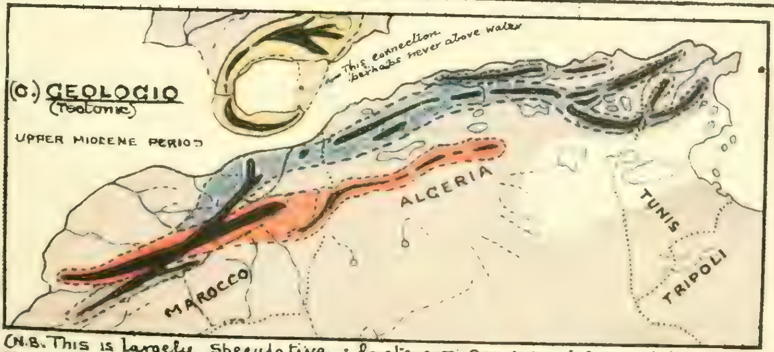
C. Bon
Rabat
Fez
Casablanca
Mazagan
Mogador
Marrakesh
Tafilalet
MAROCCO
Biskra
Djelfa
Tagurt
ALGERIA
TUNIS
TRIPOLI

Shewing in Colour the areas of "FOREST" in the sense of woodland or forest holding such typical forest-birds as Green and Great-spotted Woodpeckers, Jay, Nuthatch, Coal-tit, Creeper.
in GREEN = forest holding all, or not less than 70% of the above forms
in ORANGE = " " only 30% or less " " " "


(C.) GEOLOGIC
(Tectonic)
UPPER MIOCENE PERIOD
This connection perhaps never above water
ALGERIA
TUNIS
MAROCCO
TRIPOLI

(N.B. This is largely speculative: facts are scarce at present.)
The main tectonic formations are shewn in Colour 🟥 🟦 🟨 · cores ■
" land-areas " " tinted ▭
" sea-areas " " uncoloured.

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MAR

ITH SPECIAL REFERENCE

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Grey-shrike
and either
Telophonus
or Argya
seen, but
district
not worked.
Probably
the "African
Passerine
Genera*
are to be
found in
this zone.
Argya*
Telophonus

Very poor
in bird-
-life.
Crested-lark
corn-bunting
abundant,
stonechat
+ bee-eater
common;
little else.

Cr uch as
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ntients),
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On the open Plateau, Skylark (? race) Saxicola seebohmi, Eremophila a. atlas, very abundant, breeding and forming 99% of the whole of its bird-population (numerically). Jerboas (? sp) very numerous.

On the larger Volcanic Kopjes (wooded) and in the largest Craters (wooded) bird-life much the same as the upper parts of the "North Slope" of the Range, or at its "crest".

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, lentisk
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Zizyphus
& Lentisk
bushes,
cacties &
xerophytic
plants.
Generally
speaking
of a more
"African"
character
of vegetation
than that
of any
other zone
in this
part of
Morocco.

Monotonous
rolling hills
with great
stretches
of cultivation.
Seldom a
broken-top-
-ped hill.
Those hills
too broken
or stony
to be culti-
-vated are
clad with
a poor
Mediterranean
like scrub.

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P pper Zone.
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The "Plateau" is an almost dead-level plain; in winter with numerous "dayas" (or shallow lakes & ponds), in Summer with rich pasture (except only on the dry floors of the dayas) and occasional volcanic boulders. "volcanic kopjes" and "craters". The "volcanic kopjes" are ancient volcanic cones with shallow or imperfect craters - stand up to 500 feet above the floor of the Plateau, and are of two types -- bare ... or crowned with Cedars. The latter type is most plentiful towards the N. edge of the Plateau.
e "Craters" are without "lip" or trace of
ted material, and are, so to speak, clean cut
n the flat plain: the larger craters are
with Cedars on inside slopes. the smaller
or only slotted with grass or small bushes.

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Sandy,
stony,
calcareous

Soil mostly
light, fertile
calcareous
or rocky and
stony occa-
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layer of volcanic soil. "Volcanic kopjes"
-tiaceous lava - the "craters" basalt
t trap formation - the larger craters have
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SITED BY THE AUTHOR

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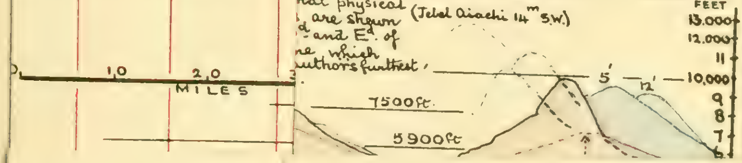


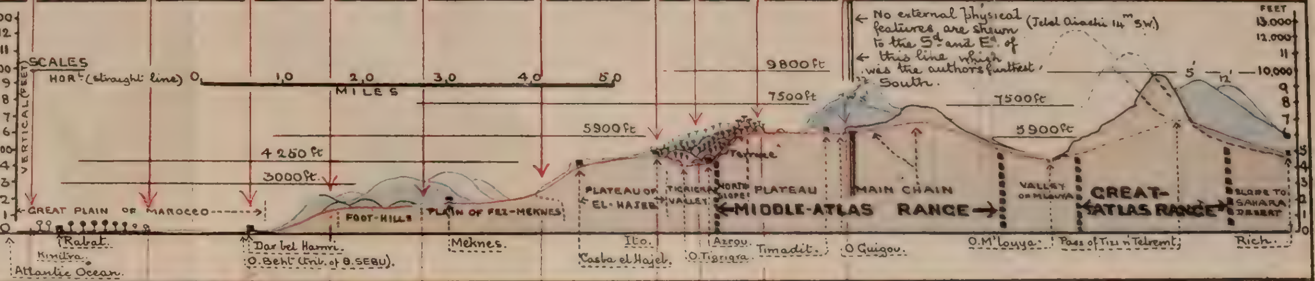
MAROCCO
WITH SPECIAL REFERENCE TO THE AUTHOR'S VISIT TO THE
MIDDLE-ATLAS RANGE

ZOOLOGICAL	The Zoology of the various parts of the country in question, is indicated in a very general way, and is mainly Ornithological. Omissions here must be regarded as mainly due to lack of space, and in branches other than Ornith.y to the author's lack of knowledge, rather than necessarily to absence of certain species.	Forest of Mamora at the it's Northern edge, is not much varied in bird-life - and seems to lack entirely many species of the Middle-Atlas forest. Abundant - Raven. Circaëtus, Black-kite. Chaffinch, Blue tit. Great-tit .... occur - Oriole, Great-spotted woodpecker.. Probably not until further South in the Forest occur Neotis. Numida & Francolinus Wild Boar plentiful.	Regarded by residents as the best great-bustard country, in easy reach of Rabat .... certainly Otis tarda here. Calandras and crested larks, corn-buntings ... . common.	Grey shrike and either Telophonus or Argya seen, but district not worked. Probably the "African Passerine Genera"* are to be found in this zone. Argya * Telophonus	Very poor in bird-life. Crested lark & corn bunting abundant, stonechat & bee-eater common; little else.	Crested larks and corn-buntings abundant. Bee-eaters & stonechats common. On the palmetto scrub tracts, lesser bustards plentiful.	Crested larks corn-buntings Calandras. Little variety of bird-life as might be expected from the bleak inhospitable aspect of this Plateau. Moorish pie is to be found in the brushwood at the South edge of the Plateau - a very "local" species	Some new birds appear here mostly outliers of the higher-zone of elevation.	Typical Resident Forest birds such as Jay, Great Spotted and Green Woodpeckers, Creeper, Coal tit, Nuthatch, etc quite abundant.... All belonging to one of the Mauretanic Races. Pied and Spotted Flycatcher, Redstart & c abundant. From level of the "Terrace" (4700 ft) upwards the Woodlark entirely replaces the Crested-lark. Golden Eagle, Lammergeier, Chough are here. Absent are Oriole, Greenfinch, Bulbul and numbers of other characteristic lowland (Marocan) species. Barbary Ape (Macacus sylvana), Wild-Boar abundant. Fox (V. atlanticus), Hare (?sp) .... frequent, etc	On the open Plateau, Skylark (?race) Saxicola seebohmi, Eremophila a. atlas, very abundant, breeding and forming 99°/o of the whole of it's bird-population (numerically). Jerboas (?sp) very numerous. On the larger "Volcanic Kopjes" (wooded) and in the largest "Craters" (wooded) bird-life much the same as the upper parts of the "North Slope" of the Range, or at its "crest".
PHYSICAL	The external physical features, principally the Vegetation, is indicated in a general way. Except in the Middle-Atlas and the Forest of Mamora, the features distant from the "Route" are only such as could be observed in transit.	The great Maritime-Plain is level for a number of miles in-land thence undulates towards the foothills. The Forest of Mamora covers some 500 square miles of this & is, speaking generally, dry-forest, mainly of cork-oak, with a sprinkling of deciduous oak (Q. bellota) wild pear & c. Glades & clearings are numerous. Much of the remainder of the Maritime Plain is cultivated and much is a waste of palmetto & other scrub.	Large, dry, poor-soil plains, cov.d with palmetto scrub, esparto grass and rank herbage - with few dwarfed cistus, lentisk & c bushes.	Zizyphus & Lentisk bushes. Cactus & xerophytic plants. Generally speaking of a more "African" character of vegetation than that of any other zone in this part of Marocco.	Monotonous rolling hills with great stretches of cultivation. Seldom a broken-topped hill. Those hills too broken or stony to be cultivated are clad with a poor Mediterranean like scrub.	The Plain rises gradually from Fez-Meknes to the El-Hajeb Plateau. The Northern parts and the vicinity of the ouads are much cultivated. towards the South these give way to great stretches of palmetto scrub.	Very stony, and large slabs of bare rock frequent. Where it exists, the soil is comparatively moist. Large areas of thistle and asphodel. Some good pasture. Towards the South edge of Plateau the Ilex-trees of the "North Slopes" stretch round the head of Tigrigra Valley and degenerate into "brushwood".	Tigrigra valley almost entirely cultivated except at head, where it is mostly pasture.	Thick primeval forest-zone, moist and essentially "cool temperate" Flora. Trees chiefly Ilex and Quercus bellota 4700-5200 ft: then commence Cedars (C. atlanticus) which gradually replace the other species, from the Crests, onto the Plateau. Some maple in Upper Zone. Shrubs:- Laurustinus, holly and Cytisus battandieri mostly; Viburnum, Pyrus, Prunus, Hawthorn (much mistletoe) & c & c frequent. Flowering plants conspicuous and abundant are:- large pink Paeonies Solomon's Seal, several other bright Liliaceae, Harebell & c & c. Rainfall greatly in excess of the territory lying to North.wd and West.rd	The "Plateau" is an almost dead-level plain; in winter with numerous "dayas" (or shallow lakes & ponds), in Summer with rich pasture (except only on the dry floors of the dayas) and occasional volcanic boulders. "volcanic kopjes" and "craters. The "volcanic kopjes" are ancient volcanic cones with shallow or imperfect craters - stand up to 500 feet above the floor of the Plateau, and are of two types .. bare ... or crowned with Cedars. The latter type is most plentiful towards the N. edge of the Plateau. The "Craters" are without "lip" or trace of ejected material, and are, so to speak, clean cut holes in the flat plain: the larger craters are clothed with cedars on inside slopes. the smaller are bare or only clothed with grass or small bushes.
SOIL	The general nature of the surface of the country is indicated.	Near the coast mostly fertile "tirs" & "hamri". Near O. Sebu are marshes. Forest of Mamora has a light sandy soil.	Chiefly sandy and probably calcareous in many parts.	Sandy, stony, calcareous	Soil mostly light, fertile calcareous, or rocky and stony occasional.	Soil rather fertile especially near ouads. No rocks or stones to speak of.	Jurassic limestone tabular formation. Rocky, stony comparatively little earth - dark, reddish		upper parts mainly Jurassic limestone - lower down occur jasper chalcedony ..... at base clay-slate	Surface of Plateau, of volcanic tufa and basalt with thin layer of volcanic soil. "Volcanic kopjes" mostly of scoriaceous lava. the "craters" basalt of columnar or trap formation - the larger craters have sometimes vertical walls of considerable height.

PROFILE

This "Profile" is a "Section" along the Route as travelled by author and is, to all intents & purposes, a projection from the "MAP" below it.

Some surface features are shewn:- in Black if "close" i.e. within a mile or two of the Route. in Blue if "distant" i.e. more than ditto, & in full line if beyond i.e. to NE.d of the Route in dotted if on this side i.e. to SE.d " " " → at the distance (miles) indicated by the blue figure.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GREAT PLAIN OF MAROCCO
FOOT-HILLS
PLAIN OF FEZ-MEKNES
PLATEAU OF EL-HAJEB
TIGRIGRA VALLEY
NORTH SLOPE
Terrace
PLATEAU
MAIN CHAIN
MIDDLE-ATLAS RANGE
VALLEY OF M'LOUYA
GREAT-ATLAS RANGE
SLOPE TO SAHARA DESERT
NOT VISITED BY THE AUTHOR
← No external physical features are shewn to the S.d and E.d of ← this line which was the authors furthest South.
(Jebel Aiachi 14m S.W.)
7500 ft
5900 ft
5
12
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Kinitra.
Atlantic Ocean.
Dar bel Hamri.
O. Beht (trib. of O. SEBU).
Meknes.
Ito.
Casba el Hajeb.
Azrou.
O. Tigrigra.
Timadit.
O Guigou.
O. M'louya.
Pass of Tizi n Telremt.
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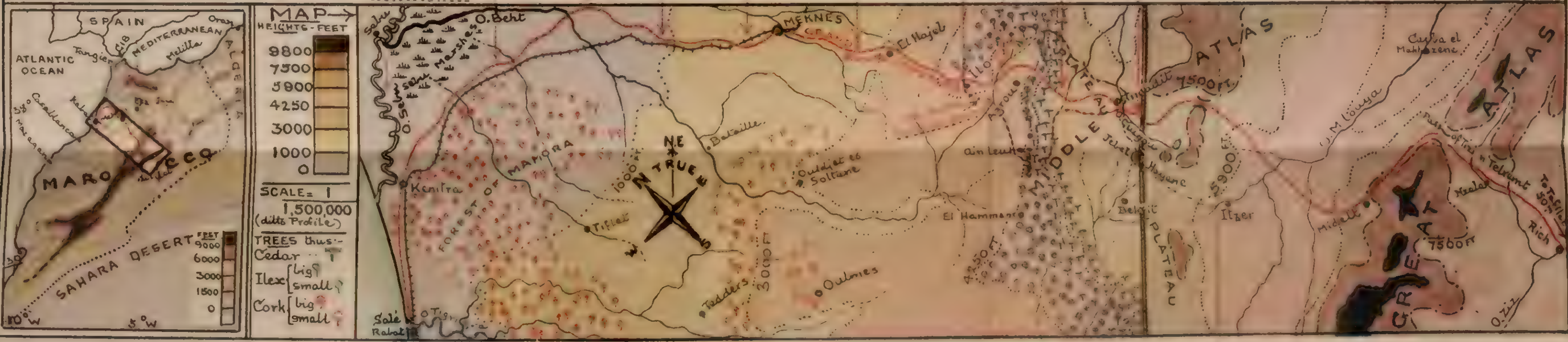
SPAIN
MEDITERRANEAN
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Melilla
ATLANTIC OCEAN
ALGERIA
Rabat
Casablanca
Mazagan
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SAHARA DESERT
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6000
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MAP →
HEIGHTS - FEET
9800
7500
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4250
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SCALE = 1 / 1,500,000 (ditto Profile)
TREES thus:-
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Cork big small
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O. Beht
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O. Sebu
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Salé
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O. Tigri
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Bataille
Ouldjet es Soltane
Tedders
Oulmes
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El Hajeb
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Azrou
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MIDDLE
Timadit
O. Guigou
Jebel Hayane
El Hammam
Bekrit
PLATEAU
4250 ft
5900 ft
7500 ft
ATLAS
O. M'louya
Itzer
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Casba el Makhzene
Pass of Tizi n Telremt
Nzala
To Tafilelt
Rich
O. Ziz
GREAT ATLAS
7500 ft

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EXPLANATION OF PLATES.

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(*b*) Azrou, showing a "Mamelon."
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(*b*) The "Crest-mounds," Middle-Atlas.
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VI.—*Obituary.*

WILLIAM BREWSTER.

William Brewster, a Founder of the American Ornithologists' Union, and at one time its President, died at his home in Cambridge, Massachusetts, on 12 July, 1919, in the sixty-ninth year of his age.

For nearly half a century, Brewster has been in the front rank of American Ornithologists. He was one of the founders of the Nuttall Ornithological Club of Cambridge, in which the American Ornithologists' Union had its origin, and was for many years its President. From 1880–87 he was assistant in charge of the birds and mammals of the Boston Society of Natural History; from 1885–1900 he served in a similar capacity in the Museum of Comparative Zoology at Cambridge, and from 1900 to the time of his death he was in charge of the birds of that institution. He devoted himself chiefly, however, to the development of the collection of North American birds contained in a private museum erected on the grounds of his home in Cambridge.

William Brewster occupied a unique position among ornithologists. Thoroughly qualified by training and exceptional powers of analysis and discrimination to become a systematic ornithologist, and with the means at his command to acquire large collections, there was every reason to believe that after his youthful enthusiasm for field-work had lost its keenness he would devote himself to a study of problems in synonymy and the subspecific variations of geographic forms. Such work as he did of this kind is authoritative, but although he amassed large collections, his interest seemed to be in living birds rather than dead ones. His contributions to ornithology are therefore actual additions to our knowledge of birds and have a permanency unfortunately wanting in much of the work of the systematist. His numerous faunal papers abound in novel observations on the habits of birds, while his monographic biographies of certain species are replete with fresh information and are presented in a literary form which make them models of their kind.

Excellent examples of Brewster's method of handling his material are shown in "A Remarkable Flight of Pine Grosbeaks (*Pinicola enucleator*)" *, his now classic memoir on "Bird Migration" †, and his "Birds of the Cambridge Region" ‡. The latter, based on over forty years' almost continuous observation, possesses unusual historic and scientific value.

We understand that at the time of his death Mr. Brewster was bringing to completion an important work on the Birds of the Umbagog Region which we trust will be published by his literary executors.

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* 'The Auk,' xii. 1895, pp. 245-246; see also 'The Ibis,' 1896, p. 137.

† Memoirs of the Nuttall Orn. Club, No. i. 1886, 4to, pp. 22.

‡ Ibid. No. iv. 1906, 4to, pp. 426.

VII.—*Notices of recent Ornithological Publications.*

Dabbene on Argentine Birds.

[Las especies y subespecies Argentinas de los géneros *Geositta* Swainson y *Cinclodes* Gray por Roberto Dabbene. An. Mus. Nac. Hist. Nat. Buenos Aires, xxx. 1919, pp. 113–195; 7 text-figs.; 2 maps.]

Two years ago Dr. Dabbene published preliminary descriptions of several new forms of these two genera, and he now fulfils a promise then made and has given us a very complete review of the Argentine species and subspecies. The recent zoological exploration of the extreme north-east corner of Argentina bordering on Bolivia and Chili shows undoubted promise of new and interesting zoological discoveries, and it is from this region that Dr. Dabbene's new form of *Geositta* was obtained, while the two new *Cinclodes* were collected in Hermite Island in the immediate vicinity of Cape Horn.

Dr. Dabbene's revision of these two genera is very complete. The synonymy and list of references are very full and exact, and are followed by full descriptions with complete list of localities, of the actual specimens examined chiefly in the Buenos Aires Museum, but also in the collections of other Museums and of some private collectors.

The paper is illustrated with topographical photographs and two maps showing the exact geographical relations of the various species and races.

Forrest on the Fauna of North Wales.

[A Handbook to the Vertebrate Fauna of North Wales. By H. E. Forrest. London: 1919, pp. 1–106.]

It will be remembered by our readers that Mr. Forrest published in 1907 a Fauna of the Counties of Anglesey, Carnarvon, Denbigh, Flint, Merioneth, and Montgomery. That work, which met a distinct want and was excellently conceived, chronicled the records of the past, brought these records up to date, and described in most interesting fashion the life-histories of the various species. The present little volume furnishes a synopsis of the same Fauna, gives further records which extend the range in many cases, and acts as a complete vade mecum for those interested in the subject.

Of special interest are the prehistoric Lynx, the Rorquals, the Barred Warbler, the Black Redstart, the Harriers, and the Crane, while the Bats and Fishes are most important items, which must not be overlooked. The continued prosperity of the colonies of Roseate Terns and the regular breeding of the Black-necked Grebe furnish particularly pleasant reading to the lover of birds.

Further notes on North Welsh zoologists, a section on Extinct Mammals, and *Corrigenda* to the earlier work, show that the present is to be taken to some extent as supplementary to it.

Hudson on British Birds.

[Birds in Town and Village. By W. H. Hudson. London, Toronto, and New York: 1919, pp. 1–274; 8 col. pls.]

This book is in the main a reprint of the author's 'Birds in a Village,' a very popular account of the species met with in a single locality, though it gives a good idea of those likely to be found in many a southern county—their abundance, increase, or decrease. There are several emendations and considerable omissions.

The new feature of the book is a supplementary portion consisting of short Essays:—such, for instance, as those on "Birds in a Cornish village," and on "Exotic Birds." The latter comprises a plea for the introduction of foreign birds, especially those of beautiful plumage or interesting habits. We are afraid that most of our readers will hardly agree with Mr. Hudson on this point, though so controversial a subject cannot be discussed in our limited space.

Shufeldt on a Philippine Gallinule.

[The Osteology of the Giant Gallinule of the Philippines, *Porphyrio pulverulentus* Temminck. By R. W. Shufeldt. Philip. Journ. Orn. xiv. No. 1. Manila: 1919.]

A highly technical article in the careful and exact method customary with the well-known author, wherein he compares the skeleton of this gigantic paludicoline bird with that of *Fulica americana.* He still considers it a close ally of *Notornis,* and emphasizes the great want of pneumaticity in the bones, common to other marsh birds. The comparison shows great similarity in the skeletons of the two birds, though there are considerable differences in the cranium; while the bones of *Fulica* are naturally much more delicate.

On the whole the differences are distinctly generic, as might have been expected.

The *Porphyrio* has now been found in four of the Philippine islands.

Tori.

['Tori.' The Aves. Bulletin of the Ornithological Society of Japan. Vol. ii. no. 8, 1919.]

[On the migration of some Waders at the mouth of the Rokugo River. By Nagamichi Kuroda. Published by the Ornithological Society of Japan, 1919.]

The last part of the publication of the Japanese Ornithological Society, which we have received through the kindness of Mr. N. Kuroda, has, we are glad to say, a translation of the title and contents, so that it is possible for those not conversant with Japanese to know at least what is to be found within its pages.

The frontispiece is the reproduction of a photograph of a flock of waterfowl on the outer moat of the Imperial Palace in Tokio, and the first paper, by Mr. T. Momiyama, deals with some specimens of birds from Saghalin Island in the Sepporo Museum.

Messrs. Y. Kuroda and J. Miyakoda give the dates of the migration of the commoner birds in the vicinity of Seoul in Corea, and Mr. Kawaguchi writes on the sexual distinctions of the Himalayan Cuckoo and illustrates his remarks with some figures. By far the longest paper is the last—by Messrs. T. Momiyama and M. Nomura—entitled "Notes on some birds from Iruma-gun in the Prefecture of Saitana." It deals with 138 species, and is illustrated by a map and a good many small photo-blocks.

With the part, the contents of which are noted above, Mr. Kuroda has sent us a copy of his paper on the migration of some of the commoner waders of Japan, which runs to a good many pages and is evidently of considerable importance. It is also published by the Japanese Ornithological Society. It would certainly be of the greatest assistance to European ornithologists if, at any rate, a short summary in some European language of these doubtless valuable researches could be appended to the original Japanese.

List of other Ornithological Publications received.

Bonhote, T. L. Bird-liming in Lower Egypt. (Cairo, 1919.)
Hopkinson, E. A List of the Birds of the Gambia. (Brighton, 1919.)
Mathews, G. M. Austral Avian Record. (Vol. iii. no. 7.)
Mullens, W. H., Swann, H. K., and Jourdain, F. C. R. A Geographical Bibliography of British Ornithology. Part 1. (1919.)
Swann, H. K. Synoptical List of the Accipitres. (Part 2.)
Thorburn, A. A Naturalist's Sketch-Book.
Witherby, H. F. A Practical Handbook of British Birds. (Part 5.)
Avicultural Magazine. (Vol. x. no. 12.)
Bulletin of the Pan-American Union. (Aug. 1919.)
France. (1918, no. 1.)
Journal of the Natural History Society of Siam. (Vol. iii. no. 3.)
Revista Centro de Cultura Scientifica. (1919, no. 4.)
Revue Française d'Ornithologie. (Nos. 124–125.)

VIII.—*Letters, Extracts, and Notes.*

Dear Sir,—The following observations of birds were made by me whilst on board the Liverpool steamer 'Ikala,' and may be of interest to your readers.

On 1 November, when the ship was in Lat. 49° 30′ N., Long. 30° W.—roughly 750 miles west of the south of Ireland—quite a stream of land-birds visited it. At 8 A.M., G.M.T., there were resting on board or circling round several Chaffinches (all males), two Starlings, one Missel Thrush, four Skylarks, and one Kittiwake. Half a gale was blowing from the east, and a long heavy swell from that direction indicated a storm between us and the land. At 2 P.M. a Skua came aboard in an exhausted condition, and during the afternoon I noted one Brambling, one Skylark, more Starlings, and some Storm Petrels. Towards dark eight or nine Black-headed Gulls made their appearance and a Heron tried to alight on the ship, which was pitching heavily, and then drifted to leeward.

The wireless weather report received the previous night recorded an "anti-cyclone between Iceland and the Faroes." Thirty-six hours previously we had experienced a gale from the S.W. lasting two days and nights.

Early in the morning of 2 November we ran into a very heavy gale from the S.E., and it blew at about sixty miles per hour for about forty-eight hours.

Yours, etc.,

Whitfield House,
Goathland, Yorks.

W. Raw, M.B.O.U.

Sir,—Colonel Verner has been corresponding with me with reference to Mr. Jourdain's letter, "The number of eggs laid by the Blackbird in Spain," which appears in the October number of 'The Ibis.'

In this letter Colonel Verner's name and book on Spain are mentioned.

He has asked me to write to you and say that since his book, 'My life among the Wild Birds in Spain,' was published he has seen several nests of the Spanish Blackbird containing more than three eggs.

The first occasion was on 9 May, 1910, when in Colonel Verner's company, I found a nest of this species containing four considerably incubated eggs.

He was much struck by my find and remarked that this was the first occasion that he had seen a nest of the Spanish Blackbird containing more than three eggs during his thirty-five years' experience of the birds of southern Spain.

On the following day two more nests, each containing four fresh to slightly incubated eggs, were found.

To the best of my recollection these were the only three Blackbirds' nests found in 1910 and 1911 by me or Colonel Verner with more than three eggs, though a good many were examined.

Colonel Verner informs me that since 1911 he has from time to time noted Blackbirds' nests in Spain with four eggs but none with five.

It is consequently obvious that nests containing more than three eggs are by no means unusual nowadays, but it is certainly curious that this should be the case now and not ten years and more ago.

Is it possible that the Spanish Blackbird has become more prolific for some reason unknown?

Climate, food, and vegetation cannot have altered appreciably, but the number of those interested in Spanish oology has undoubtedly increased since those days and more nests are probably examined in consequence.

The Forest,
Kerry, Montgomeryshire.
20 November, 1919.

Yours faithfully,
W. M. Congreve,
Captain R.A.

Dear Sir,—I enclose the following *Erratum*:—

In 'The Ibis,' October 1917, p. 584 (T. Carter, "On the Birds of Dirk Hartog Island and Peron Peninsula"), for *Lamprococcyx plagosus carteri* (Western Bronze Cuckoo) read *Neochalcites basalis wyndhami* (Western Narrow-billed Bronze Cuckoo).

The two specimens of the above bird, *basalis*, and the bulk of the collections obtained on Dirk Hartog Island in 1916 were left in the care of the Perth Museum in West Australia until quite recently, on account of marine risks, and were only received here last week.

Upon checking them over, I found that both the skins are labelled *basalis*.

Thomas Carter.

Sutton,
15 November, 1919.

Fifth Annual Oological Dinner.

The fifth Oological Dinner was held at Pagani's Restaurant on Wednesday, 10 September, 1919. Thirty-seven gentlemen were present, including a large number of members of the B. O. U. Lord Rothschild took the Chair at 7 o'clock.

After the loyal toast, the Chairman in his opening remarks announced that, owing to the success of these gatherings the Committee had decided to hold *two* Dinners and Exhibitions annually in future.

The CHAIRMAN then exhibited the following eggs :—

Locustella fluviatilis. Three clutches from Hungary, and about fifty eggs, illustrating variation, from Breslau in Silesia.

Locustella luscinioides. Seven clutches from Hungary and Roumania.

Sylvia nana deserti. Six clutches from the western (Algerian) Sahara.

Scotocerca inquieta saharæ. Three clutches from the western Sahara.

Acrocephalus syrinx. Three clutches from Guam (Marianne Is.).

Prinia inornata. Two clutches, showing extremes of variation, from India.

Metabolus rugensis. A rare Flycatcher from Guam (Marianne Is.). The clutch consists of one egg only.

Cleptornis marihei. A rare Honey-eater from Saipan (Marianne Is.). Three clutches.

Crex crex. An extraordinary heavily blotched set of eight eggs from Northamptonshire.

The following clutches of eggs were exhibited by Mr. ROBERT W. CHASE :—

Sylvia communis. Six clutches. One set of white eggs.

Sylvia curruca. Six clutches, very fine varieties.

Sylvia simplex. Six clutches, one set blotched and streaked all over.

Sylvia atricapilla. Six clutches, including a splendid set of the erythristic type.

Melizophilus undatus dartfordiensis. Four clutches taken at Churt, Surrey, so long ago as 1864.

Locustella nævia. Four clutches. In one set all the markings form a perfect zone at the large end.

Acrocephalus streperus. Six clutches. In one set the ground-colour is white with pinkish-grey shell-markings; another is an extraordinary set of pale cream-grounded eggs very slightly freckled with brown.

Acrocephalus palustris. Two boldly marked clutches.

Acrocephalus schœnobænus. Six clutches, fine varieties, including an unusually light-coloured set.

Phylloscopus trochilus. Six clutches, fine varieties, including a set marked with large reddish blotches.

Phylloscopus sibilatrix. Six clutches.

Phylloscopus collybita. Six clutches. One of these sets contains four white eggs, the others with two spots of dark brown.

Regulus cristatus. Two clutches. In one set the marks on the eggs form perfect zones.

The Rev. F. C. R. Jourdain exhibited eggs of the following Warblers:—

(*a*) A series of five clutches of Sardinian Warbler (*Sylvia m. melanocephala*) showing remarkable variation, ranging from red and grey types to a very boldly blotched type—all taken by himself in Spain and Corsica.

(*b*) A clutch of Bowman's Warbler (*Sylvia melanocephala momus*), till quite recently almost unknown in collections, from Mesopotamia.

(*c*) A clutch of Ménétries' Warbler (*Sylvia mystacea*) from S.W. Persia; also extremely rare.

(*d*) Two clutches of Palestine Warbler (*Sylvia melanothorax*) from Cyprus. Only four other clutches are known to have been taken.

(*e*) One clutch of La Marmora's Warbler (*Sylvia sarda*) from Sicily.

(*f*) Two clutches of Dartford Warbler (*Sylvia undata undata*) from Spain, showing the red and green types.

(*g*) One clutch of Clamorous Reed-Warbler (*Acrocephalus stentoreus brunnescens*) from Mesopotamia. An unusual variety.

(*h*) One clutch of Paddyfield Warbler (*A. agricola*) from Kashmir.

(*i*) Three clutches of Blyth's Reed-Warbler (*A. dumetorum*) from the Altai district, showing considerable variation. These eggs are scarce.

(*j*) A clutch of the Japanese Bush-Warbler (*Cettia cantans*). An unusual variety.

(*k*) A clutch of the scarce *Urosphæna squameiceps* from Japan.

Mr. Staines Boorman exhibited:—

(*a*) A very finely-zoned set of Dartford Warbler. British taken.

(*b*) Three clutches of five eggs each, of the rose-coloured variety of the Blackcap. All taken in Surrey within a half mile radius, in 1908.

(*c*) Two clutches of seven, and three of six, of the Wood-Warbler, taken in the New Forest and Dulverton districts. One set very finely marked with dark blotches, and another set very lightly marked. Other sets showing varieties.

Mr. P. B. Smyth exhibited:—

(*a*) A clutch of Whitethroat's eggs, of which two were pure white, the third like a Sedge-Warbler's, and the fourth like a Garden-Warbler's.

(*b*) A rarely marked and abnormally large clutch of nine of the Willow-Warbler.

(*c*) Cuckoo with two Marsh-Warbler (British) and a drawer of Marsh-Warbler's eggs, showing wide variation.

Mr. R. H. Read exhibited a series of nests and eggs of British and Continental Warblers, including several species of *Phylloscopus* and *Hypolais*. Also nests and eggs of Rufous Warbler, Great Reed-Warbler, Cetti's Warbler, Orphean Warbler, Spectacled-Warbler, Grasshopper-Warbler, and Marsh-Warbler from Somerset and Dorset. Also of Lesser Whitethroat with white eggs (Somerset), and a very heavily marked set of six (Sweden). Also of Blackcap with red eggs (Somerset), Garden-Warbler with pure white eggs (Sussex), Dartford Warbler (Surrey), Sedge-Warbler with very fine red eggs (Scotland) and another with white eggs (Thames). Also a fine nest of Nightingale, together with nest and eggs of Northern Nightingale (Denmark) for comparison.

Among the clutches exhibited by Mr. Read without nests, the following call for special mention:—Common Whitethroat, fine red eggs and a pink clutch; Sardinian Warbler, red and green phases; Grasshopper-Warbler, large eggs heavily zoned at larger end (Northumberland); Nightingale, a set of green eggs from Corsica as large as those of the Northern Nightingale; Willow-Warbler, a very heavily marked set from Kent.

Mr. Read also showed a curious double nest of the Great Tit (Somerset) and another of the same species which he had found built in the open in a hawthorn bush. The bird was sitting on the nest, which contained three eggs.

Mr. Edgar Chance exhibited the wonderful series of Cuckoo's eggs, taken by himself in the seasons of 1918 and 1919. Full particulars of these will be found in 'British Birds' Magazine (January 1919 and September 1919). The series is quite unique in its completeness, and probably forms one of the most important additions to our knowledge of Cuckoo problems that has ever been made.

Mr. F. G. Lupton exhibited:—

(*a*) A set of four erythristic Lapwing's eggs, taken near Settle, Yorkshire. Ground-colour very rich, but markings normal.

(*b*) A clutch of four Lapwing's eggs, of the very rare cyanic form. Mr. Lupton remarked that this was the only set he had ever obtained from among over 450,000 Lapwing's eggs inspected during 24 years, and that it appears to be rarer than the erythristic phase. Taken near Settle.

(*c*) A clutch of six Swallow, taken in 1875 by the late Thomas Altham of Lancashire. The eggs are smaller and rounder than usual, with extremely large blotches of two shades.

(*d*) A set of two Nightjar, from the late Frank Norgate's collection. One egg white without markings, the other only slightly marked.

(*e*) A set of five Red-backed Shrike (British) with three white eggs, the other two with only one or two pale lilac spots.

(*f*) A clutch of six Tree-Pipit (British). Pale blue eggs, with faint reddish markings.

Mr. D. W. Musselwhite exhibited a series of eggs of the Pallid Shrike (*Lanius excubitor elegans*) collected in the neighbourhood of Kantara, Suez Canal. All the eggs were taken by the exhibitor, and mostly in 1919.

Mr. Renaut exhibited a fine series of British Warbler's eggs. These included a set of Reed-Warbler's resembling the Marsh-Warbler's, and four fine sets laid by the latter bird. Also eggs of the Grasshopper and the Dartford Warbler showing distinct types.

Mr. E. C. Stuart Baker exhibited a large number of eggs of Indian Warblers and made the following remarks:—

"The first five boxes exhibited contain series of eggs of the various geographical races of *Prinia inornata* and are very interesting in that, unlike what obtains amongst the vast majority of eggs of geographical races of the same species, these little birds show an extraordinary difference in the coloration. *Prinia i. jerdoni* from Ceylon has very bright blue eggs well marked with tiny black horse-hair lines chiefly intertwined at the larger end. Less numerous are large blotches and spots of deep purple-black and black. In India the typical *P. i. inornata* has eggs precisely the same but a trifle less brilliantly blue and with, as a series, fewer lines and more blotches. Next in Assam and Upper Burma we have *P. i. burmanica*, similar but again duller, and rarely with a reddish tinge; below these, in southern Burma, we have *P. i. blanfordi*, in which the prevailing tinge is pink, the blue having practically disappeared except in a very few clutches. Finally, we come to Siam, in which country we find *P. i. herberti* laying eggs of a brilliant pale pink, whilst the markings are of deep chocolate-red, blood-red, and blackish red. We thus pass from what, broadly speaking, is a brilliant blue egg to an equally brilliant pink one. The reasons for this transition are not obvious. It is true that the red eggs occur in the wettest climate, and that the birds laying them often breed in grass lands in, or surrounded by, swamps. On the other hand, as the range works north from Ceylon to Assam and thence again east and south to Siam, we pass through areas of considerable drought and yet find no corresponding change in the colour.

"The next lot of boxes contains series of eggs of another species of Warbler, the subspecies of which range over the same area as the last, but whereas the various races of *Prinia inornata* lay eggs which vary little in any given area, this bird (*Orthotomus sutorius*) lays eggs—as may be seen from the exhibit—which vary immensely throughout each portion of the whole of its range. But an examination of the exhibit will show that *Orthotomus sutorius sutorius*, *O. s. atrigularis* (possibly a different species), *O. s. maculicollis*, and *O. ruficeps* lay eggs which, however greatly they vary *inter se*, cannot be assigned to any one species or subspecies by an inspection of the eggs alone. As a contrast to the extreme variation in type in the eggs of *Orthotomus* I show here boxes containing eggs of (1) Warblers of the *Prinia flavirostris* group, and (2) Warblers of the *Horornis* group, which show how singularly uniform the eggs of these two groups are throughout their whole range, the first-named always laying brick-red eggs, and the second equally constantly chocolate-coloured ones.

"A rather interesting contrast in the eggs of closely allied genera is shown in the two succeeding boxes. In the first are the entirely white eggs of various species of *Cryptolopha*, and in the next the well-spotted pinkish eggs of the genus *Abrornis*. These two genera are linked together by some of our best ornithologists; but their habits widely differ, and, as every one knows, the former make lovely moss-balls of nests which they line with thistle-down and place in mossy banks or on moss- and fern-covered stumps, whereas the latter lay their eggs in hollow bamboos or tiny holes in stumps on pads of feathers, moss, and vegetable-down. One clutch of eggs, that of *Abrornis schisticeps*, now shown is, I believe, unique, and the others are very rare. They are: *C. cantator* and *castaneiceps, A. superciliaris*, and *albigularis*.

"Other eggs shown are those of *Acrocephalus agricola* and *A. concinnens,* generally considered to be subspecies of the same species, but probably quite distinct, for whilst the two birds vary practically in nothing but their wing-formula, they breed over a huge area together, though the former makes a Reed-Warbler's nest in swamps, and the latter lays in rose-bushes high up on the open pasture-lands above them. The eggs are indistinguishable.

"The remaining Warblers' eggs are shown on account of their great rarity, many being unique or almost so. They are: *Graminicola bengalensis striata* (taken by Capt. E. G. Herbert in Siam), *Acanthoptila nepalensis, Phaetornis locustelloides, Phyllergates coronatus, Horeites brunneifrons, Urosphema squamiceps, Phylloscopus humei humei* and *P. h. præmium, Phylloscopus nitidus viridanus, P. n. plumbeitarsus,* and *P. proregulus.*

"Finally, I show three species of the Regulidæ: (1) *Regulus regulus anglorum,* the eggs of which are too well known to need description, though I would draw special attention to the two finely spotted clutches; (2) *Cephalopyrus flammiceps,* which lays tiny bright blue eggs in holes of trees sometimes 40 feet from the ground; and (3) *Leptopœcile obscura sophiæ,* a tiny Warbler-like bird which makes a nest (one exhibited) like that of a Long-tailed Wren placed in the thorny scrub-bushes, a few inches high, which cover the great uplands in Tibet where it is found.

"Many of the eggs shown I owe to the great generosity of the following gentlemen. Those from Siam were obtained by Mr. J. W. F. Williamson and Captain E. G. Herbert, nearly all the Burmese eggs by Mr. F. M. D. Mackenzie, and those from Ceylon by Mr. W. E. Wait. It is with the greatest pleasure I acknowledge these magnificent gifts, in most cases gifts made with no expectation of any return."

Mr. Stuart Baker also exhibited, on behalf of Captain C. R. S. Pitman, a fine series of the eggs of *Chettusia leucura,* taken by that gentleman in Mesopotamia during the recent campaign in that country.

Mr. Percy F. Bunyard exhibited the eggs of thirty species of British Warblers from his collection:—

Whitethroat (*Sylvia communis*). A series embracing practically every known form and many remarkable varieties; amongst the latter erythrism was represented by four clutches, British and Continental. Also a clutch of five from Surrey almost pure white with suffused grey underlying markings.

Lesser Whitethroat (*Sylvia curruca*). A representative series in which the rare cyanic form was conspicuous; the characteristic large suffused brown markings were particularly noticeable in the type eggs.

Garden-Warbler (*Sylvia simplex*). A very beautiful series showing extreme and modified forms, and varieties with pure white and greenish ground.

Blackcap (*Sylvia atricapilla*). In this series varieties were well represented; conspicuous among them are two clutches of five almost pure white eggs from Suffolk. Compared with "*simplex*" eggs they were smaller on the average. The type eggs of "*atricapilla*" and "*simplex*" could not easily be confused; varieties, however, require careful identification. A unique series of twenty-five clutches of the erythristic form were also exhibited, British and Continental, and which had taken thirty years to obtain.

Sardinian Warbler (*Sylvia melanocephala*). A series from Spain, in which the erythristic form was well represented. These eggs apparently go through a greater variation than "*undatus*" eggs, which they somewhat resemble.

Orphean Warbler (*Sylvia orphea*). Four clutches of typical eggs from Spain.

Subalpine Warbler (*Sylvia subalpina*). Three clutches from Greece and Austria, showing great variation.

Dartford Warbler (*Melizophilus undatus*). A series showing great variation, British and Continental; among the former, clutches with white ground were conspicuous, the greenish form predominating; among the latter were two erythristic clutches, also a clutch of six. A series of nests and mounted specimens of materials were also shown; these were very much admired.

Rufous Warbler (*Agrobates galactodes*) and Grey-backed Warbler (*Agrobates galactodes familiaris*). A small series of each; one of the latter was taken by the late Captain F. C. Selous in Asia Minor. There is apparently no characteristic by which the eggs of these two closely allied species could be safely separated.

Grasshopper Warbler (*Locustella nævia*). A very beautiful series, embracing practically every known form and variety. Eggs with conspicuous white ground are worthy of note.

Savi's Grasshopper Warbler (*Locustella luscinioides*). Two very distinct clutches of five from Hungary; one has the ground-colour almost obliterated by the fine markings, the other has conspicuous white ground finely-speckled brownish black.

Cetti's Warbler (*Cettia cetti*). Several clutches of five showing great variation in colour, from rose-pink to brick-red.

Reed-Warbler (*Acrocephalus streperus*). A characteristic series which, however, do not show such a pronounced variation as "*palustris*" eggs.

Blyth's Reed-Warbler (*Acrocephalus dumetorum*). A clutch of five from the Altai district, Central Asia. These do not differ essentially from *palustris* eggs; they are, however, generally larger and more pointed.

Marsh-Warbler (*Acrocephalus palustris*). A series of British and Continental clutches showing great variation in markings and ground-colour; one clutch has a pure white ground, which is apparently rare.

Great Reed-Warbler (*Acrocephalus arundinaceus*). These very handsome eggs were well represented; two clutches of the Eastern form (*A. orientalis*) were also shown. They do not, however, differ except in size, the latter being on the average smaller.

Sedge-Warbler (*Acrocephalus schœnobænus*). A series which show little marked variation, which is characteristic of these eggs. The conspicuously mottled form which was represented is, however, worthy of mention.

Aquatic Warbler (*Acrocephalus aquaticus*). Two clutches of five. These do not differ from "*schœnobænus*" eggs.

Icterine Warbler (*Hypolais icterina*) and Melodious Warbler (*Hypolais polyglotta*). Clutches of both of these Tree-Warblers were exhibited; they did not show any marked difference. The latter, however, appear to be rather smaller.

Willow-Warbler (*Phylloscopus trochilus*). A series showing great variation. The two forms (*i. e.* the spotted, and closely speckled) were represented; also two clutches showing distinct and heavy zones round the large ends.

Arctic Willow-Warbler = Eversmann's Warbler (*Phylloscopus borealis*). A clutch of four from the Pasvik River, Russian Lapland. Mr. Bunyard said he believed this to be one of the only, if not the only clutch of authenticated eggs in this country. They are recorded in the Bulletin of the B. O. C. for May 26, 1909, No. clii.

Wood-Warbler (*Phylloscopus sibilatrix*). A very beautiful series, showing extreme and modified forms: among the former were some exceptionally heavily marked clutches.

Chiffchaff (*Phylloscopus collybita*). A series of typical clutches; also one well-authenticated clutch of six resembling "*trochilus*" eggs.

Siberian Chiffchaff (*Phylloscopus tristis*). Two clutches which do not differ from "*collybita*" eggs.

Yellow-browed Warbler (*Phylloscopus superciliosus*). A typical clutch of four from Turkestan; markings same colour as "*collybita*" eggs.

Pallas' Warbler (*Phylloscopus proregulus*). A typical clutch from N.W. Frontier, India, taken by C. H. T. Whitehead. The markings are darker than in "*trochilus*" eggs.

Mr. Bunyard also exhibited a series of—

Barred Warbler (*Sylvia nisoria*), from Germany and Sweden, and read the following short paper on them:—

On the eggs of the Barred Warbler Sylvia nisoria.

In many works on Oology only meagre reference appears to have been made to these remarkable eggs, and then mostly in regard to their distinctive characteristics. From an oological point of view, I consider them not only distinctive but absolutely unique, mainly because the whole of the pigment lies beneath the outermost lime layer. In the type egg this is most constant, and even those markings which at first sight appear to be on the surface, I find, on a closer examination, are really beneath the gloss or glutinous layer.

In the series which I exhibit there are one or two eggs with brownish markings which appear to be on the surface, but these I attribute to nest stains.

Lechner in 'Oologia Neerlandica' calls attention to similar characteristics in the eggs of the Common Whitethroat (*Sylvia communis*); I consider, however, that a certain form (*i.e.* the marbled form of the Nightjar, *Caprimulgus europæus*) shows, oologically, certain well pronounced similar characteristics, as may be seen by the eggs of that species exhibited for comparison. The texture of the shells is also distinctive; some have the appearance of being corrugated; the pittings lie very deep and widely apart.

British Museum Expeditions.

Mr. Willoughby P. Lowe left England on the 14th of November last on an important expedition to the West Coast of Africa on behalf of the British Museum (Natural History). He will be the guest of Captain Dane, R.N., who, in the interests of scientific exploration, most generously invited Mr. Lowe to accompany him as naturalist on H.M.S. 'Dwarf'—of Cameroon fame. Mr. Lowe proceeded to Lagos in Southern Nigeria, and, while waiting to pick up the cruiser, will form a collection of birds in the neighbourhood.

On joining the 'Dwarf,' he will have an opportunity of visiting numerous localities on the West Coast, and hopes to pay particular attention to Gaboon and the Rio Muni and to visit the rivers Moonda, Camma, Agowé, and Muni—the type locality of many of Du Chaillu's birds described by Cassin. A special attempt will be made to obtain specimens of the rare Wood Ibis (*Lampribis rothschildi*) from Prince's Island, which has been recently renamed, and of which we do not possess a single specimen in England. Mr. Lowe also hopes to ascend the Senegal river and to make collections in the interesting country between Dagana and Kayes, and, if circumstances permit, he will visit certain islands of the Cape Verde group, from the study of which, we believe, there is still much to be learnt. Provided the necessary funds are available, the authorities of the Natural History Museum hope to avail themselves to the full of Captain Dane's kindness and to keep Mr. Lowe at work in the field for a year or two. In that case, extremely valuable collections should be obtained for the National Collection and our knowledge of the West African Ornis greatly increased. We understand that as the collections are sent home to the British Museum they will be placed in the hands of Mr. D. A. Bannerman for determination, and that the results will be published, in due course, in the pages of 'The Ibis.' We wish Mr. Lowe the very best of luck in his important undertaking; no better naturalist or collector could have been chosen for the work.

Mr. David A. Bannerman is leaving England on the 10th of January on an expedition on behalf of the British Museum (Natural History). He is proceeding first to Gran Canaria, where he hopes to obtain a series of the rare Partridge (*Caccabis rufa australis*). From Gran Canaria he intends to visit Palma and will camp with his wife in that island for a month, thence proceeding to the islands of Gomera, Hierro, and Tenerife. While in the last-mentioned island he will pay special attention to the desert fauna of the southern coast and hopes to have an opportunity of ascending the famous Peak (12,200 feet). This expedition will complete his Ornithological Survey of the entire group, and the collection of Canarian birds in the British Museum will then be unrivalled.

From the Canary Islands, Mr. Bannerman intends, if he can get a boat, to go down the West African coast to Senegal and will make his headquarters at Dakar. From this base he hopes to visit the environs of Kayes on the Senegal river. Birds from this locality should prove of exceptional interest, the majority of collectors in the past having confined their attentions to the country traversed by the Dakar–St. Louis railway. Mr. Bannerman expects to return to England again some time in June.

Captain Hubert Lynes, R.N., C.B., C.M.G., and Lieut. J. C. I. McConnel left England on the 24th of December on an expedition to the western part of the Anglo-Egyptian Sudan. They intend to proceed to El Fasher in Darfur, and thence, if possible, to visit Jebel Marra and other parts of the Anglo-French confines, studying the Ornithology and Natural History. Until 1916, when the rebellious Sultan of Darfur, Ali Dinar, was defeated by the British forces near El Fasher, the huge province of Darfur was only known to the civilised world from a few flying visits by Slatin Pasha and others; the central Saharan highlands of Tibesti to the north-west of Darfur were visited by Nachtigal in 1869, his journey occupying five years, and more recently between 1912–1917 by Commandant Tilho, but practically nothing has been recorded of the Natural History of these vast territories. We are authorised to say that the Natural History collections acquired by the present expedition will be presented to the British Museum (Nat. Hist.). As will be seen from this resumé of their plans, Captain Lynes and Lieut. McConnel have embarked on an extremely enterprising expedition, the results of which should prove of very great value. The province of Darfur is a *terra incognita* to the Ornithologist, and we look forward with special interest to the ornithological results obtained, which should help considerably to fill in a gap long felt by workers on north African birds. We hope that if occasion permits, Captain Lynes will send us further news of his adventurous journey.

Queensland Discussion of Penguin Protection.

At the Brisbane Congress of the Royal Australian Ornithologists' Union, Mr. C. Lord (Tasmania) emphasized the necessity for Macquarie Island being made a sanctuary for the preservation of the Penguin. Captain White (South Australia) moved "That this Union is of the opinion that Macquarie Island should be declared a sanctuary for the perpetuation of the fauna of the Antarctic." He said that the Federal Government proposed to buy the island from Tasmania, which asked £15,000 for it. This was rather high, seeing that the island was leased for £40 a year for private exploitation. Dr. Mawson had said there would very soon be a dash into Antarctica to secure its furs and oils, and it was very desirable that the Federal Government should step in and make a sanctuary of Macquarie Island. Mr. Lord seconded the motion, which was carried, and the Council was empowered to take action even to the expenditure of funds to secure the object of the motion.

We have just heard that the Editor of 'The Ibis' intended to be present at the annual meeting of the A. O. U. during his stay in New York, where he had been working at the Museums. About the end of December it was his intention to leave for Japan, *via* Vancouver, where we hope that he will be as successful as he will be interested in observing the birds of the Islands.

We are informed with regard to Dr. Hartert's work 'Die Vögel der paläarktischen Fauna,' that Part X., beginning with the Ibididæ, is now in print, and will probably appear early in 1920. As the whole manuscript is completed, this work will not remain unfinished, and subsequent parts are expected to come out in reasonable time. The printing, however, is at present only possible with pecuniary sacrifice, and the price of each part will be considerably increased. The work will be larger than originally estimated and will extend to three big volumes, including a supplement to Volume I.

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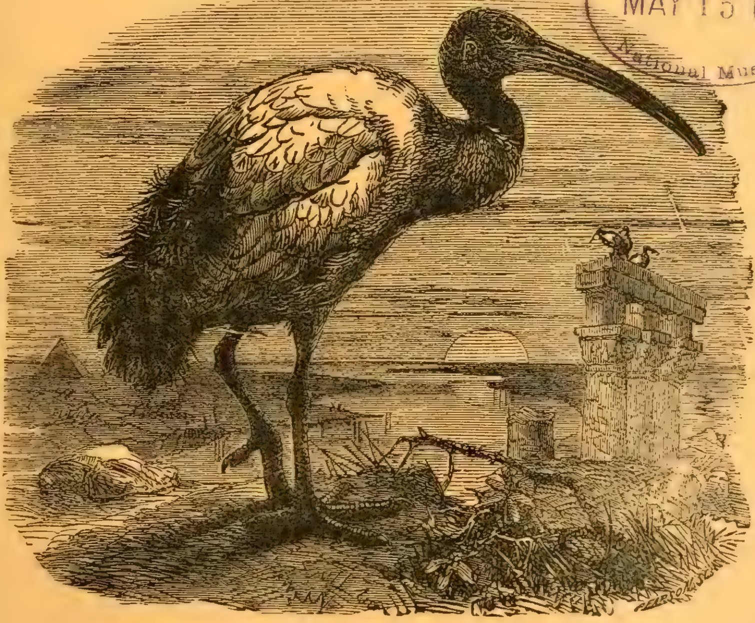

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IX.—*List of the Birds of the Canary Islands, with detailed reference to the Migratory Species and the Accidental Visitors.* Part VI. Appendix A—Appendix B. By David A. Bannerman, M.B.E., B.A., M.B.O.U., F.R.G.S.

[Continued from p. 132.]

Appendix A,

Which includes all birds that have been recorded on evidence which requires further proof before the species can be admitted to the list of authentic occurrences. All birds in the Appendix are named binomially if any doubt exists as to which race they belong.

It will be seen by a glance at the names which make up Appendix A that several of the species are most unlikely ever to occur again in the Canary Archipelago. It is equally certain that others whose names are included here will some day have to be transferred to the list of authentic visitors.

It has been anything but easy to draw up this list and determine which species should be given the "benefit of the doubt" of having occurred in the islands. Opinions are sure to vary as to whether or not some of the species would have been placed better in Appendix B or even in the Systematic List, but judgment has been formed only after most careful investigation.

For ten years I have been working at the birds of this group and studying the writings of previous authors, so that I have formed very definite opinions on the merits and trustworthiness of the works consulted and of the records which they contain.

If any reasonable doubt exists as to whether or not a bird has occurred in the Canaries, I have included that species in Appendix A. It will always be an easy matter to add a species to the list of Authentic Visitors. It will be much more difficult to delete a species which has been included on insufficient evidence.

Notwithstanding, there is bound to be criticism of a list containing some 310 names, and I hope the criticism will be public, as the list published in 'The Ibis' is only a forerunner of a much larger work which I some day hope to publish.

The birds included in Appendix A number twenty-four, as follows :—

Family FRINGILLIDÆ.

Emberiza cia. Meadow-Bunting.

Emberiza cia Linn. Syst. Nat. 12th ed. 1766, p. 310—Type locality : S. Europe.

A member of the B. O. U., Mr. William Serle, kindly wrote to tell me that while staying in Gran Canaria he had observed a few of these Buntings at close range in a garden near Las Palmas on the 10th of May, 1910. No specimens were obtained, but Mr. Serle was convinced of his correct identification and watched the birds for some time through powerful glasses. I know of no resident bird or regular visitor with which he could have confused it.

Range. The Meadow-Bunting breeds in southern Europe and in winter visits northern Africa.

Family Motacillidæ.

Anthus campestris. Tawny Pipit.

Alauda campestris Linn. Syst. Nat. 10th ed. 1758, p. 166—Type locality: Sweden.

The records of the Tawny Pipit occurring in the Canary Islands are meagre and rest on the evidence of Meade-Waldo, who wrote (Ibis, 1893, p. 191): "I have seen this Pipit only in Fuerteventura, where it was common in sp ing."

Meade-Waldo was in Fuerteventura in March and April 1888, and in the middle of February and March 1889, and again in April 1890. In reply to my query as to whether he obtained any specimens, Mr. Meade-Waldo has kindly written to me under date 4 August, 1918: "With regard to *Anthus campestris,* I saw many in small flocks, especially the last time I visited Fuerteventura (April 1890). *I shot one or two* and gave them to Canon Tristram, but he did not skin them as he did not pay much attention to migrants when we had island forms to skin."

Bolle's notes (J. f. O. 1857, pp. 288, 289) given under the name of *Anthus campestris,* as also those under *Anthus trivialis* (J. f. O. 1854, p. 455), obviously refer to the common Pipit of the islands, *Anthus b. bertheloti.* There is no question of Meade-Waldo having fallen into this error; he knew both forms well and collected many of the latter, but until specimens are secured I hesitate to include the Tawny Pipit amongst the authenticated visitors.

Polatzek writes (Orn. Jahrb. 1909, p. 126) that neither he nor Von Thanner has ever seen it.

Range. The Tawny Pipit breeds in Europe, south-western Asia, and north-west Africa; it winters in tropical Africa. Dr. Hartert records it as far south as Senegambia. I have examined specimens in the British Museum from the following localities in Africa:—Morocco (no date), Tangiers (March and June), Egypt (February to April), Sudan (January), White Nile (April), Nubia (no date), Somaliland

(December, January, and April), Abyssinia (December, February, and March), Orange Free State (June!).

Family Regulidæ.

Regulus ignicapillus madeirensis. Madeiran Fire-crest.

Regulus madeirensis Harcourt, Sketch of Madeira, 1851, p. 118—Type locality: Madeira.

The Madeiran Fire-crest is said by Cabrera (Catálogo, p. 42) to occur accidentally in the woods of Tenerife. He did not possess a specimen, and it is probable that the bird has been wrongly identified, a particularly bright coloured Gold-crest being mistaken for a Fire-crest. I include it here, as Cabrera clearly shows that he did not confuse it with the Tenerifian Gold-crest, *Regulus regulus teneriffæ,* for he includes this as "*Regulus cristatus*," and in addition enumerates *Regulus satelles* Koenig, which is of course a synonym of *R. r. teneriffæ*. Cabrera was evidently not aware that Koenig had only renamed the island bird, which Cabrera knew as *R. cristatus*.

Range. The Madeiran Fire-crest is confined to the highlands of the island of Madeira.

Family Laniidæ.

Malaconotus poliocephalus. West African Grey-headed Bush-Shrike.

Lanius poliocephalus Licht. Verzeichniss der Doubletten des Zoologischen Museums, 1823, p. 45—Type locality: Senegambia.

There is only one record from the Canary Islands. Bolle (J. f. O. 1857, p. 275) says that he saw an example of *Laniarius icterus* Cuv. (=*M. poliocephalus*), which had been shot in Tenerife, in Dr. Binna's collection at Orotava.

Dr. Bolle certainly notes that the specimen of this rare Shrike had been procured in Tenerife; but he evidently did not shoot the bird himself, and it is much more likely to have been an imported skin.

Bolle was a careful ornithologist, and is certain to have handled the bird himself and to have faithfully recorded what he was told. I have therefore assigned this species to Appendix A.

Dr. Antonia Binna's collection has unfortunately been quite lost sight of, and nothing seems to be known of the owner of this private collection or what has become of the birds which it contained.

Range. The West African Grey-headed Bush-Shrike is found in the West African subregion from Senegal to north Angola, ranging east to the Niam Niam country and Tanganyika.

Family SYLVIIDÆ.

Melizophilus undatus. Dartford Warbler.

Motacilla undata Boddaert, Tabl. Pl. Enl. 1783, p. 40—Type locality: Provence.

Floericke (Aus der Heimat des Kanarienvogels, 1905, p. 51) says there is a specimen of this Warbler (*Sylvia provincialis*) in the Museum at Laguna, Tenerife, which was killed in a neighbouring town during the spring migration. Cabrera, whose collection is housed in the Laguna Institute, does not mention this bird in his Catálogo (1893), and Polatzek, who includes the species in his list on the authority of Floericke, remarks (Orn. Jahrb. 1909, p. 124) that the bird must have been obtained since Cabrera's Catalogue was published.

I have not had an opportunity of examining this skin. It may or may not be correctly identified. Floericke's assertions require to be very carefully sifted. In any case there is the possibility of its being a "trade-skin" which has crept in amongst the Cabrera collection of locally-shot birds. Unfortunately many of the birds in the Canary Museums are undoubtedly killed anywhere but in the Canary Islands.

Range. The typical form of the Dartford Warbler inhabits south-west Europe. Races have been described from Great Britain (*M. u. dartfordiensis*) and north-west Africa (*M. u. toni*).

Acrocephalus aquaticus. Aquatic Warbler.

Motacilla aquatica Gmelin, Syst. Nat. i. pt. 2, 1789, p. 953—Type locality: Carniola.

This Warbler is said to have occurred in the Canary Islands.

Webb and Berthelot (Orn. Canarienne, p. 13) go so far as to give Gran Canaria as its habitat, but without any further local information. If it has ever inhabited this island it would doubtless have frequented the Maspalomas Charco or the pools of Arguineguin—no other places in Gran Canaria would be suitable for its habitat (Ibis, 1912, p. 564).

Bolle quotes the above authorities (J. f. O. 1854, p. 453) under *Sylvia aquatica*, and the bird is also cited by Cabrera (Catálogo, p. 43) as *Calamodita schœnobænus* Scop.

Recently Von Thanner has recorded (Orn. Jahrb. 1908, p. 214) that he saw an Aquatic Warbler ("*Calamoherpe aquatica*") in some close grass on the 14th of March, 1905, in Fuerteventura; the bird was not obtained.

Range. The Aquatic Warbler breeds in central and southern Europe and in north-west Africa. It probably winters in tropical Africa, but this is not known for certain.

Family Turdidæ.

Œnanthe isabellina. Isabelline Wheatear.

Saxicola isabellina Cretzschmar, Atlas zu Rüppell's Reise, Vögel, 1826, p. 52—Type locality: Nubia.

This species has only once been recorded, by Meade-Waldo (Ibis, 1889, p. 515), who notes that he saw a stuffed example in Cabrera's collection in Tenerife.

The record was omitted from Meade-Waldo's final list (Ibis, 1893), and in answer to my query as to why the bird was not then included, Mr. Meade-Waldo has kindly written to me as follows, under date August 4, 1918:—"At this length of time it is rather hard to remember things exactly, but if I noted *Saxicola isabellina* as being in Cabrera's collection, no doubt but that it was there, but it may have been some form of Isabelline desert Wheatear which at present bears some other name."

As it is twenty-five years since Mr. Meade-Waldo published his last list, he may have omitted the Isabelline Wheatear from his final list with intent and the fact have escaped his memory after so long a period.

The bird is not mentioned by Cabrera in the list of his birds from the islands, and on the above evidence I do not feel justified in including the species amongst the authentic visitors.

Range. The Isabelline Wheatear breeds in Asia and winters partly in Egypt and eastern Africa and in India. It is very unlikely to occur in the Canary Islands again.

Family PICIDÆ.

? **Dryobates minor.** Lesser Spotted Woodpecker.

Picus minor Linn. Syst. Nat. 10th ed. 1758, p. 114—Type locality: Sweden.

The Lesser Spotted Woodpecker is first recorded by Busto (Topografia medica, 1864, p. 104) almost certainly in error.

Meade-Waldo (Ibis, 1889, p. 7) wrote of a visit to Gomera in 1888, "I feel almost sure I saw a Lesser Spotted Woodpecker."

Cabrera included it (Catálogo, 1893, p. 35) as a species met with accidentally in the Canaries on the authority of Busto and Meade-Waldo.

Polatzek remarked (Orn. Jahrb. 1909, p. 121) that if *D. minor* occurred in Gomera he would certainly have seen it, but the only Woodpecker which he thought he saw there was larger than this species.

When two such observers as Meade-Waldo and Polatzek both *think* that they saw a Spotted Woodpecker of some form in the island of Gomera, we cannot entirely dismiss the records as valueless and place them in Appendix B. There is no Woodpecker of any species known to inhabit this island, but any ornithologist visiting Gomera should keep a particularly sharp look out in the hope that he may solve the problem of the mystic race. It is extremely unlikely that if a

Woodpecker is ever discovered in Gomera that it will prove to be any race of the Lesser Spotted. It is certainly very remarkable that the islands of Palma and Gomera have no Woodpecker living upon them when two races of *D. major* are found in Tenerife and Gran Canaria respectively.

Range. The typical Lesser Spotted Woodpecker inhabits northern Europe. Numerous races are recognised in Europe, Asia, and northern Africa (Algeria and Tunisia). *D. minor* is said once to have inhabited the Azores, where it is now apparently extinct.

Family CAPRIMULGIDÆ.

Caprimulgus europæus. Nightjar.

The Nightjar is recorded by several observers on somewhat fragmentary evidence. It is uncertain which form has occurred, if any, in the Canaries.

Busto includes the "*Caprimulgus*" in his list (Topografia medica, p. 104).

Cabrera (Catálogo, p. 36) notes that he saw one at Tejina (Tenerife), but the bird does not appear to have been obtained.

Polatzek was told in Fuerteventura that some of these birds were occasionally seen by day in holes in the rocks, resting on their way through the islands (Orn. Jahrb. 1909, p. 119). No specimens have ever been obtained, and local evidence in the Canaries is most unreliable.

Range. Typical *C. europæus europæus* Linn. (Syst. Nat. 10th ed. 1758, p. 193—Type locality: Sweden) breeds in Europe and winters in Africa ranging to the Cape. It passes down the west coast of Africa and has occurred in Cameroon.

A small race, *C. e. meridionalis* Hartert (Ibis, 1896, p. 370), occurs in Spain, and in some of the islands and countries bordering the Mediterranean as well as in north-west Africa.

Caprimulgus ruficollis. Red-necked Nightjar.

The evidence of this species occurring in the Canary Islands is not very satisfactory.

It is mentioned by Webb & Berthelot, who say (Orn.

Canarienne, p. 24) " it arrives sometimes in the Canaries at the beginning of autumn." It is not included in Busto's list, as has been erroneously stated.

Cabrera mentions it as an accidental migrant but according to his catalogue had no skin in his collection, although Polatzek (Orn. Jahrb. 1909, p. 119) notes that Cabrera is said to have shot a specimen in Tenerife.

Dr. Hartert, who examined Cabrera's collection, tells me (*in litt.*) that he could not find a skin of this species, so that a mistake has probably been made. Hartert correctly states (Vög. pal. Faun. p. 851) that its occurrence in the Canaries is doubtful.

C. r. ruficollis has occurred in Madeira, and there is no reason why it should not have done so in the Canary group.

Range. The Red-necked Nightjar [*Caprimulgus ruficollis* Temm. Man. d'Orn. 2nd ed. i. 1820, p. 438—Type locality: Algeciras] is an inhabitant of southern Spain, Portugal, and Morocco.

A subspecies, *C. r. desertorum* Erlanger [J. f. O. 1899, p. 521—Type locality: Tunisia], takes its place in Algeria and Tunisia. Until an example can be examined it must remain doubtful, which (if either) has occurred in the Canaries.

Family Meropidæ.

Merops orientalis viridissimus. African Green Bee-eater.

Merops viridissimus Swains. Birds West Africa, ii. 1837, p. 82—Type locality: Senegal.

Cabrera says that this species, which he incorrectly calls *M. viridis** Gmel., occasionally appears in the Canary Islands in company with *M. apiaster* (Catálogo, p. 38). He had no specimens, however.

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* *Merops viridis* Linn. was described (Syst. Nat. 10th ed. 1758, p. 117) from Java, Benghalia, and is applicable to the Indian Green Bee-eater. I prefer to use Swainson's name for the African Green Bee-eater, as his bird was described from Senegal. It is obviously the African bird which Cabrera intends.

Merops viridis Gmelin = *M. viridis* Linn.

Hartert has shown (Nov. Zool. xvii. p. 482) that *M. viridis* Linn. has nothing to do with *M. viridissimus* at all but must be applied to the bird commonly known as *M. sumatranus*, and consequently *M. viridissimus* is the correct name for the African Green Bee-eater.

Range. The Green Bee-eater inhabits north Africa and extends south as far as Senegambia. Various races have been described.

Family Alcedinidæ.

Halcyon leucocephala. White-headed Kingfisher.

A specimen of what was probably *H. leucocephala acteon* or possibly *H. leucocephala leucocephala* was identified by Bolle (J. f. O. 1857, p. 319) in the Binna collection in Tenerife as *Halcyon rufiventris* Dohrn (= *H. erythrorhynchus* Gould = *H. leucocephala acteon*).

The bird was said to have been obtained in Tenerife. Polatzek, referring to this specimen, says that Cabrera *told* him that it was said to have been shot "in the mountains" (Orn. Jahrb. 1909, p. 121).

Cabrera (Catálogo, p. 39) notes that he never observed this bird in the Canaries, but remarks that it may occur accidentally, as it is so common in the Cape Verde Islands.

Hartert rightly rejected this species from his list (Nov. Zool. 1901, p. 307) on the ground that it may have been brought to the island as a skin. Very little seems to be known of the Binna collection, so often referred to by older writers. Whether this colletion was composed only of locally killed specimens is not stated by anyone.

Range. H. l. leucocephala ranges from Senegal southwards, and across Africa. *H. l. acteon* is confined to the Cape Verde Islands. Lesson described *Dacelo acteon* in Traité d'Orn. 1831, p. 247—Type locality: "Cap Vert ('San Yago')." The type locality is supplied by Pucheran (Rev. et Mag. de Zool. 1853, p. 392), *cf.* Claude Grant (Ibis, 1915, p. 266). Lesson gives no type locality himself. Either form might have found its way to the Canary Islands.

Family STRIGIDÆ.

Otus scops scops. Scops Owl.

Strix scops Linn. Syst. Nat. 10th ed. 1758, p. 92—Type locality : Italy.

The status of the Scops Owl in the Canary Islands is still doubtful, but I believe it may eventually have to be included in the authentic list.

I have been unable to trace any genuine locally killed specimens; as, however, the species has been quoted freely as *breeding* in the Canary Islands, I append all that is definitely known to me concerning it. The following notes can only of course refer to the typical bird.

In 1902 Polatzek saw in Lanzarote two stuffed examples of this Owl; without any data he could not establish whether they had been killed in Lanzarote or not, but he notes that the species is said to occur very seldom in the island. The two specimens mentioned, he adds, were sent from Lanzarote to Tenerife amongst a collection of birds for sale (Orn. Jahrb. 1908, p. 161). Polatzek notes that to his personal knowledge no more were "killed" up to 1905 (he left the Canary Islands for good in September 1904). He remarks in this paper that "Information concerning the breeding of this species does not seem to be well authenticated."

In 1904 the above-mentioned two Owls were offered for sale to Von Thanner in a market-place in Tenerife. This ornithologist (who is apparently basing his supposition on the opinion of someone else) says that he believes it breeds in Lanzarote in the palm-trees and is convinced it is to be found in Fuerteventura also (Orn. Jahrb. 1905, pp. 60, 61).

It is certainly much more likely that *O. scops scops* should be found in the Canary Islands than the following species.

Range. The Scops Owl breeds in southern Europe and north-west Africa, migrating in winter (on the west coast) to Senegambia.

Carine noctua. Little Owl.

The claim of the Little Owl to a place in this list depends on the important queries

(1) What species is *Noctua minor* Brisson from the Canary Islands, as interpreted by Serra?
(2) Was Serra's identification correct?

Under the above name Serra recorded (Ornitologia Canaria) a bird which he collected (*"recogido"*) at Tegueste in Tenerife. I have not been able to examine Serra's original work for myself.

Dr. Hartert is of the opinion (Nov. Zool. 1901, p. 307) that *N. minor* = *Athene* (*Carine*) *noctua*, or perhaps a north African subspecies.

Cabrera considered "*Noctua minor*" to be a resident bird in Tenerife (Catálogo, p. 34), but Polatzek (Orn. Jahrb. 1908, p. 161) is inclined to think that Cabrera really intended the Scops Owl (*Otus scops*) when he wrote *N. minor*!

I have placed this species in Appendix A although I am by no means certain that it should not be relegated to Appendix B.

If Dr. Hartert's view is correct, the Little Owl which is said to have found its way to the Canaries may have been *C. n. noctua*, *C. n. glaux*, or even (though less probably) *C. n. saharæ*.

Range. Typical *C. n. noctua* [*Strix noctua* Scopoli, Annus Hist. Nat. 1769, p. 22—Type locality: Carniola] is restricted to Europe.

C. n. glaux [*Noctua glaux* Savigny, Descr. Egypte, Syst. Ois. Egypte, 1810, p. 45—Type locality: Egypt] is a subspecies confined to north Africa ranging from Egypt to Morocco.

C. n. saharæ [*Strix saharæ* Kleinschmidt, 'Falco,' v. 1909, p. 19—Type locality: Mouleina near Biskra] appears to inhabit southern Tunisia, southern Algeria, south of the Atlas, and south-east Morocco, south of the Atlas.

Family FALCONIDÆ.

Hieraëtus fasciatus. Bonelli's Eagle.

Aquila fasciata Vieill. Mém. Soc. Linn. Paris, ii. 1822, p. 152—Type locality: Montpellier, S. France.

Meade-Waldo, writing in 'The Ibis,' 1893, p. 185, and giving a list of birds which have been seen almost without doubt, although never actually procured, included this Eagle and says "... an Eagle seen several times above Esperanza .... which almost beyond a doubt was Bonelli's Eagle (*Nisaëtus fasciatus*)."

I give this record for what it is worth. Meade-Waldo should certainly know the bird well.

Range. Bonelli's Eagle ranges over the greater portion of southern Europe, and is generally distributed in Spain and Portugal. In Africa it is found in Tunisia, Algeria, and Morocco, and in the last named country is said by Erlanger to be more abundant south of the Atlas (*cf.* Whitaker, Birds of Tunisia, ii. p. 109).

Milvus migrans. Black Kite.

Falco migrans Boddaert, Table Planches Enl. 1783, p. 28, no. 472—Type locality: unknown.

I doubt whether a specimen of the Black Kite has ever been shot in the Canaries.

Cabrera records (Catálogo, p. 31) that this species (*M. niger*) comes on migration at uncertain times (De paso en épocas no determinadas).

Polatzek also notes that it passes through the Canary Islands occasionally, but states that there are no specimens (Orn. Jahrb. 1909, p. 119).

Dr. Hartert believes that there may have been some confusion between the Black and the immature Common Kite (Nov. Zool. 1901, p. 307).

Range. The Black Kite breeds in central and southern Europe, in south-western Asia, and in northern Africa from Morocco to Tunisia. In winter it migrates to Africa, ranging to Madagascar on the east.

Family ANATIDÆ.

Anser anser. Grey-Lag Goose.

Anser anser Linn. Syst. Nat. 10th ed. 1758, p. 123—Type locality: Sweden.

It seems fairly certain from the accounts of ancient writers that an extensive lake was once to be found in Tenerife near the town of Laguna, from which lagoon the ancient capital of Tenerife takes its name. That this lagoon teemed with wildfowl seems to be certain, for Viera mentions how the Captain General of the Canaries amused himself in the citadel of Laguna by watching the Falcons which were dashing down upon the various waterfowl, forced by the peasants with their slings to rise from the surface of the lake.

Cabrera in his Catálogo, p. 68, under *Anser cinereus* Mey., wrote "Esta especie, mencionada por Viera y Manrique, fué en un tiempo frecuente en las lagunas de Tenerife." Viera gives an account of an *Anser* under the name "Ganso" in his Diccionario, p. 306 (1866), but does not mention the species.

It is quite possible that this Goose did occur in olden days in Tenerife, and I have therefore included it in Appendix A, although it stands to reason that no very definite proof can exist.

Range. The Grey-Lag Goose breeds in the extreme north of America and in northern Europe, resorting in winter to southern Europe and northern Africa, extending eastwards to China.

Querquedula querquedula. Garganey.

Anas querquedula Linn. Syst. Nat. 10th ed. 1758, p. 126—Type locality: Sweden.

The Garganey is included solely on the very poor evidence of Cabrera, who in his list (Catálogo, p. 68) includes "*Querquedula circia*" as an accidental visitor to the Archipelago. Cabrera did not have a specimen in his own collection and gives no further information of the specimens seen.

Polatzek mentions the bird amongst the doubtful occurrences (Orn. Jahrb. 1909, p. 132).

Range. The Garganey breeds throughout the greater part of the Palæarctic Region—wintering in northern and tropical Africa, southern Asia eastwards to Japan, and even reaching New Guinea.

Its occurrence in the Canary Islands as a straggler in winter might therefore be expected.

Family GRUIDÆ.

Grus grus grus. Common Crane.

Ardea grus Linn. Syst. Nat. 10th ed. 1758, p. 141—Type locality: Sweden.

The Common Crane was mentioned by Meade-Waldo in his list (Ibis, 1893, p. 199, under species No. 82) from the "Eastern Islands," on the evidence of the Spanish fishermen who described to him a large grey bird as occasionally appearing, which he concluded could only have been this species. It seems hardly worth while to include this bird even in Appendix A on such very doubtful evidence, but as it is a species which might well be expected to occur on rare occasions in the Archipelago, I include it for what it is worth.

Range. The Crane breeds in Europe from Scandinavia southwards to Spain and Italy. It winters in north Africa from Tunisia to Morocco, extending in east Africa to Abyssinia.

Family PUFFINIDÆ.

Puffinus gravis. Greater Shearwater.

Puffinus gravis O'Reilly, Voy. to Greenland, 1818, p. 140—Type locality: Greenland to Newfoundland.

Cabrera particularly mentions this species as *Puffinus major* Fabr. in his List of Birds found in the Canary Islands (Catálogo, p. 65) in addition to "*Puffinus cinereus* Kuhl" (= *P. k. fortunatus*) and "*Puffinus anglorum* Kuhl" (= *P. p. puffinus*). He says it is only found in company with these two species.

I have not been able to trace a specimen of this Shearwater from the Canarian Seas. It is more than likely to occur there, but would easily pass unnoticed at sea amongst the countless numbers of *Puffinus kuhli fortunatus*, from which, however, it may be easily distinguished by its distinct brown cap.

Range. The Greater Shearwater breeds on Tristan da Cunha, and probably on other islands of the southern Atlantic, and ranges over the entire Atlantic Ocean from Greenland and Iceland to the Falkland Islands and the Cape of Good Hope.

Family RALLIDÆ.

Fulica cristata *. African Crested Coot.

Fulica cristata Gmel. Syst. Nat. 10th ed. i. pt. 2, 1789, p. 704—Type locality: Madagascar.

Cabrera is responsible for the inclusion of this bird. It figures in his list (Catálogo, p. 61) as well as *Fulica atra*, so that it is obvious he was aware of two different birds. Of the Crested Coot, Cabrera remarks "Especie sumamente rara en Canarias, pero que suele encontrársela en compañia de la anterior" (*F. atra*).

Range. The African Crested Coot inhabits Africa generally.

Porphyrio cæruleus. Purple Gallinule.

Fulica cærulea Vandelli, Mem. Acad. Real. Sci. Lisboa, i. 1797, p. 67—Type locality: Portugal.

The Purple Gallinule has been obtained on one occasion in Tenerife, where Cabrera saw a specimen which had been caught there (Catálogo, p. 61). Previously to this [*Porphyrio cæsius* Barrère] is mentioned by Mompó [Catálogo de las Aves de Tenerife, 1876, p. 256] from the Canary Islands, but no great reliance can be placed on this record. Neither am I inclined to include the above record of Cabrera's as a genuine visitor.

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* *Fulica cristata* may be distinguished from *Fulica atra* (1) by the entire absence of white tips to the inner secondaries; (2) by having knob-like excrescences at the top of the frontal shield.

I know that Gallinules are occasionally shipped in crates to the Canary ports. In fact, my mother-in-law kept four imported Gallinules near Las Palmas, in the chicken-run in 1911–12. These were imported from Dakar and belonged to another species, *P. porphyrio* Linn. Eventually one of these birds escaped, and I myself saw it fly off towards the golf links; the other three were brought to England and are now living in the Zoological Gardens in Regent's Park, where I understand they have bred. Cabrera's bird may quite possibly have been an "escape."

Range. The Purple Gallinule (*P. cæruleus*) inhabits the countries bordering the Mediterranean from Portugal and Morocco to Sicily. *P. porphyrio* inhabits the greater part of Africa, and if either race occurs in the Canaries it is probably this form.

Family Columbidæ.

Columba palumbus. Wood-Pigeon.

Cabrera mentions the Wood-Pigeon in his list as an occasional, but not very frequent, migrant, and notes that in some years it is only to be met with in the mountains of Aguirre, near Santa Cruz de Tenerife (Catálogo, p. 52); he says that it is cited by Berthelot, but I can find no mention of it in his book. Also by Busto and Mompó, but as the pigeons of the Canaries were then imperfectly known no reliance can be placed on these records.

Range. The typical Wood-Pigeon inhabits Europe, and ranges to north-west Africa. Birds from the Azores (*Columba palumbus azorica*) have been regarded as separable. It is possible that chance stragglers from that group of islands have occurred in the Canaries.

Columba trocaz. Madeiran Pigeon.

Columba trocaz Heineken in Brewster's Edinburgh Journal Sci. 1829, p. 230—Type locality: Madeira.

This Pigeon is said by Cabrera (Catálogo, p. 53) to arrive only on rare occasions ("*aunque rara vez*") in the Canaries.

Webb & Berthelot (Orn. Canarienne, p. 26), though correctly including *Columba junoniæ* [*C. laurivora* auctorum] from the Canary Archipelago, confused it with the Madeiran bird, believing both to be the same species. This may have led Cabrera to have included *C. trocaz* in his list, although he includes correctly the three resident pigeons of the Canary Islands.

It is, of course, quite within the bounds of possibility that a specimen of *C. trocaz* might find its way to the Canaries from Madeira, but that it arrives even "on rare occasions" I cannot believe. Its occurrence is best looked upon with considerable suspicion until a genuine example is obtained; Cabrera had not a skin in his collection.

Range. C. trocaz is confined to the island of Madeira.

Streptopelia senegalensis. Senegal Turtle-Dove.

Turtur senegalensis Linn. Syst. Nat. 12th ed. 1766, p. 283—Type locality: Senegal.

The Senegal Turtle-Dove is first recorded by Bolle (J. f. O. 1857, p. 332) from the Canaries. He includes *Turtur senegalensis* from Fuerteventura, and as breeding in that island.

Cabrera notes (Catálogo, p. 53) that it is of accidental occurrence ("Viajera accidental"), only met with in the chestnut woods of Santa Ursula and Victoria, in Tenerife.

Cabrera had no skins in his collection, and I feel very doubtful about the correct identification of this species.

Range. The typical Senegal Turtle-Dove (*S. senegalensis senegalensis*) inhabits tropical Africa from Senegambia to Sierra Leone, eastwards to northern Nigeria: the exact extent of its range is not known. The races of the Dove and their distribution have been fully dealt with by Dr. Hartert (Nov. Zool. xxiii. pp. 81–83). Since then Messrs. Sclater & Mackworth-Praed have still further split up this group (Ibis, 1920). Both these papers should be consulted.

APPENDIX B.

List of Birds that have been recorded from unreliable sources, so that the records can be dismissed as absolutely valueless.

Many of the birds in this Appendix have been quoted by more recent writers as authentic migrants, but without additional proof of their genuine occurrence in the Canary Archipelago. Most of the species here included were first recorded by Ledru in 1810 and then by the Spanish writers from 1866 to 1882.

Birds whose names appeared in these old lists through having obviously been wrongly identified are not included here. Very few of the resident birds in the Archipelago bore the names which they now possess, for they were not then recognised as distinct from the Continental forms.

For instance, the Shrike was then known as *Lanius algeriensis* or *Lanius meridionalis*, the Titmice as *Parus major* and *Parus cæruleus*, etc., etc.

None of these names are included in this list, for it is quite obvious that they refer to species which we now know under other names, and that the Continental species never really occurred in the Archipelago.

Another case in point where names might be included in this Appendix but are best left out altogether, is afforded in Cabrera's work. This author notes in his list "*Regulus cristatus*," by which he, of course, intends *Regulus r. teneriffæ*; but he also includes, as if it referred to an entirely different species, "*Regulus satteles*," which name is a synonym of *R. r. teneriffæ*.

I have not in this Appendix given the original reference and type locality of the species included.

Instead I have, when possible, given a reference to Cabrera's work, "Catálogo de las Aves del Archipiélago Canario," 1893 (quoted as "Catálogo, 1893"), for this author quotes, amongst others, from the works of the early Spanish authors—Viera, Busto, Manrique, Mompó, and Serra—and is the first author to give a complete list of the birds of the Canary Archipelago since Moquin-Tandon, Webb, and Berthelot wrote their monograph in 1841.

In every case where I have been able to examine the original work I have given a page reference to these early Spanish writers, for they are for the most part responsible for the names which appear in this Appendix.

Since writing the Systematic List, which has already appeared in print, I have discovered that three of the works of the old Spanish writers mentioned by me in Part I., p. 89, of my paper are in the Tring Museum. The first is :—

> Diccionario de Historia Natural de las Islas Canarias ó índice alfabético descriptivo de sus très reinos Animal, Vegetal y Mineral. Por D. José de Viera y Clavijo.*

This Diccionary contains the names of a number of birds indexed under the Spanish name for the species, the Latin generic name and sometimes also the specific name being included in brackets, *i. e.*, **Garajao** (STERNA), or again **Engaña muchachos** (AVIS CURRICULA, Buff.), the first named being the Tern ? species, the second being the Courser (*C. gallicus*) ! Unless we happen to know the Spanish equivalent of the bird's name it is therefore anything but easy to follow Viera's List of Birds, especially as they are mixed up with names of plants and minerals !

I do not put very much faith in the records appearing in this work and many have been relegated to Appendix B, when I had no further evidence from other sources of the occurrence in the Canary Islands of species mentioned by Viera.

The next work which I have now examined is that of Busto y Blanco, a book entitled 'Topografia medica de Las Islas Canarias,' published at Sevilla in 1864. This work contains a bare list of names of birds (pp. 103–105). Seventy-seven species are enumerated arranged under four columns thus :

Orden. *Familia.* *Nombres técnicos.* *Nombres vulgares.*

The spelling of the names is often obviously incorrect, no references are given, authors' names are not mentioned, and although the Spanish name of each bird is given it is nevertheless often difficult to determine what species is intended.

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* Published at Las Palmas de Gran Canaria, 1866.

The third work studied is certainly the most important. It appeared in the form of a paper entitled "Catálogo de las Aves de Tenerife observadas por Don Vincente Momró," and was published in the 'Anales de la Sociedad Española de Historia Natural,' Tom v. pp. 241–258. Madrid, 1876. Sixty-three species are enumerated, and under the majority of the species appear notes on their nesting habits. Apparently these nesting notes do not refer to the birds in the Canary Islands but to their allied forms in Spain!

These rare books can be seen in the magnificent library of the Tring Museum. I have taken pains to make full use of Lord Rothschild's and Dr. Hartert's kindness in lending them to me, a privilege which I deeply appreciate and here acknowledge.

Had I seen these works earlier they would have made practically no change in the systematic List of Authentic Species which I have already published, the majority of the records belonging to the following Appendix B.

In Part I. of this paper, p. 90 (Jan. 1919), I included, when possible, the dates when naturalists actually worked in the Canaries apart from the dates of publication of their various works. In this connection I omitted to note that Ledru (*cf.* Part I. p. 86) appears to have first sighted the island of Palma on the 25th of October, 1796, and says that he remained one hundred and twenty-nine days in the group, sailing for the West Indies on the 15th of March, 1797. Many of his observations are quoted in the following pages.

Likewise in the "List of Publications" consulted, which I published on pp. 86–89 of Part I., I omitted to mention the work of Dr. Curt Floericke, entitled "Aus der heimat des Kanarienvogels," 1905, pp. 1–107 (Vienna). As noted elsewhere, this work is most unreliable, and has been severely criticised by Polatzek in several of his papers. It is therefore suitably united with Appendix B.

The Birds included in Appendix B number 55, as follows:—

Pastor roseus. Rose-coloured Pastor.

Mentioned as a possible Rare Visitor to the Eastern Canaries by Bolle (J. f. O. 1857, p. 267). The bird has never been known to occur.

Spinus spinus. Siskin.

It is obvious that the Siskin should never have been included in the Canarian Avifauna.

Fringilla spinus Linn. is first mentioned by Ledru (Voyage aux îles de Téńeriffe, vol. i. 1810, p. 181), and next by Webb & Berthelot (Orn. Canarienne, p. 23) in their lists from Tenerife.

Bolle, in his first paper (J. f. O. 1854, p. 459), says that the Siskin nests in the pine woods and distinguishes it from the Canary (*Serinus canarius*). In his next paper Bolle (J. f. O. 1857, p. 317) corrects this statement and notes that *Chrisomitris spinus* Boie is certainly only a rare visitor to the islands now that the Elder-tree is no more. Bolle continues that in a letter to him Berthelot "acknowledged openly that he knew very little about the Siskin as a Canarian bird, but thought he had brought back a skin with him to Paris." Bolle points out that Berthelot had very little to do with the 'Ornithologie Canarienne,' which was written by Moquin-Tandon from Berthelot's notes.

Mompó includes this species in his 'Catálogo de las Aves de Tenerife' (1876), p. 251.

"*Chrisomitris spinus*" is also cited by Cabrera (Catálogo, p. 50), whose remark that it is an accidental migrant is doubtless based on the evidence of the writers mentioned above, for he notes that the bird is included by Mompó; and, after noting that it nests in the pines, remarks that it is a very rare bird of passage and that the only specimen which he saw was caught in January 1873 and appeared to be a young male.

Pyrrhulauda modesta. Finsch's Lark.

In the J. f. O. 1864, p. 412, Otto Finsch described a bird as *Pyrrhulauda modesta* which he said came from the Canary Islands. It was described from a solitary female example and at the time evoked considerable discussion. Finsch compared it with *P. nigriceps* Gould and with *P. melanauchen* Cab.

Cabanis (J. f. O. 1868, p. 219) believed that *P. modesta* was the female of *P. nigriceps*.

Finsch, in answer to this, wrote (Trans. Zool. Soc. vii. p. 275) that the female skin which he described as *P. modesta* was more closely allied to *P. melanauchen* than to *P. nigriceps*.

Godman (Ibis, 1872, p. 224) pointed out that the bird may not have come from the Canaries in the first instance. Finsch gave no evidence in support of this.

Sharpe (Cat. Birds, xiii. p. 651) remarks in a footnote β that he was unacquainted with the bird.

Whatever species this bird may subsequently turn out to have been, it certainly did not come from the Canary Islands. The name of the collector is not given by any of the authorities who handled the bird. As a species of *Pyrrhulauda* inhabits the Cape Verde Islands (*P. nigriceps*), it is very probable that this is the real locality from which the skin of *P. modesta* Finsch originally came.

Loxia curvirostra. Crossbill.

Busto is the first to mention this bird (Topografia medica, 1864, p. 104).

Cabrera (Catálogo, 1893, p. 51) includes it on Busto's authority.

Fringilla cœlebs spodiogenys. Tunisian Chaffinch.

First included by Mompó (Catálogo Aves Tenerife, 1876, p. 250), obviously thus naming the resident Chaffinch incorrectly.

Cabrera has himself confused the Chaffinches badly

(Catálogo, 1893, p. 49): excluding the Blue Chaffinch, he enumerates *Fringilla tintillon* (for *F. c. canariensis*), *Fringilla palmæ* (for *F. c. palmæ*), and *Fringilla spodiogena* as an accidental bird of passage.

Moreover, he gives *F. africana* Le Vaill. as a synonym of *F. spodiogena*, although these are two different races of the Chaffinch.

It is evident that Cabrera believed these two north African forms to be one and the same, and that it appeared accidentally in the Canaries.

It is probable that the Hierran Chaffinch (*F. c. ombriosa*), which has only recently (1913) been recognised as a distinct race, has been confused.

Emberiza citrinella. Yellow Hammer.

Ledru (Voyage aux îles de Ténériffe, vol. i. 1810, p. 182) includes *Emberiza citrinella* without further note.

Busto (Topografia medica, 1864, p. 104) gives it in his list, but Mompó and Viera do not appear to include it.

Cabrera (Catálogo, 1893, p. 51) notes that it is mentioned by "most authors" but does not mention these authors by name.

Emberiza hortulana. Ortolan Bunting.

Busto includes it (Topografia medica, 1864, p. 104).

Cabrera notes it (Catálogo, 1893, p. 51) on the authority of Ledru and Busto. I cannot find it mentioned anywhere in Ledru's 'Voyage aux îles de Ténériffe,' vol. i. Two "Emberizes non déterminés" are given, however, in addition to those we can fix.

Galerida cristata. Crested Lark.

Busto mentions this Lark (Topografia medica, 1864, p. 104).

Included by Cabrera (Catálogo, 1893, p. 52), on the authority of Busto, as a bird of passage.

Various forms of this species are recognised in Africa.

Motacilla lugubris. Pied Wagtail.

Motacilla lugubris Temm. is first mentioned by Ledru (Voyage aux îles de Téénériffe, etc., vol. i. 1810, p. 183).

Cabrera (Catálogo, 1893, p. 44) includes it on the authority of Ledru (*l. c.*) and Busto (Topografia medica, p. 103) as a rare accidental visitor.

I cannot find that either Ledru or Busto mention it.

Sitta cæsia. Nuthatch.

Bolle recorded the Nuthatch (J. f. O. 1857, p. 320) purely on native information as occurring in the Mercèdes Woods in Tenerife.

He has been quoted by Cabrera (Catálogo, 1893, p. 39).

Sitta europæa. European Nuthatch.

Ledru mentions this species (Voyage aux îles de Ténériffe, vol. i. 1810, p. 182).

Cabrera includes the bird (Catálogo, 1893, p. 39) on the authority of Ledru, remarking that it has probably been confused with *S. e. cæsia.*

Lanius excubitor elegans. Elegant Shrike.

Cabrera includes this Shrike (*Lanius hemileucurus* Finsch & Hartl.) on his own responsibility from Fuerteventura (Catálogo, 1893, p. 47).

This North African race has probably been confused with the resident Shrike *Lanius excubitor kœnigi.*

Cabrera erroneously refers to the Canary Island form under the name *Lanius algeriensis*, for it was then considered identical with this Algerian race. It has since been separated, however. Cabrera evidently considered there were two distinct races of the Grey Shrike in the Canaries, as he also mentions *L. e. elegans* under the name *L. hemileucurus* Finsch & Hartl.

Lanius minor. Lesser Grey Shrike.

According to Cabrera (Catálogo, 1893, p. 47), Serra (Ornithologia Canaria, 1879–1882) is responsible for the inclusion of this bird in the Canarian List, as he records an example killed on the coast of Tenerife. A confusion with *Lanius excubitor kœnigi*—the Grey Shrike of the islands—is probably responsible for the error.

I have not seen Serra's publication, but believe from Cabrera's account of species No. 38 that *L. minor* is the only Grey Shrike mentioned in Serra's list. The inference is obvious.

Sylvia subalpina. Subalpine Warbler.

This species has certainly never occurred in the Canary Islands.

Godman in his paper (Ibis, 1872, p. 175) has simply transferred the name *Sylvia passerina* Lath., as employed by Webb & Berthelot (Orn. Canarienne, p. 15) and Bolle (J. f. O. 1854, p. 454), to *Sylvia subalpina* Bonelli without any explanation of his action. Godman doubtless thought the description of *S. passerina* given by Webb & Berthelot applicable to the Subalpine Warbler and to no other bird.

This error has been copied by Cabrera (Catálogo, p. 42), but Hartert, Polatzek, and I detected the mistake, and the first-named pointed it out many years ago in Nov. Zool. 1901, p. 308.

Sylvia orphea. Orphean Warbler.

Busto mentions this species (Topografia medica, 1864, p. 103).

Curruca orphea Temm. is included by Cabrera in his list (Catálogo, 1893, p. 41) on the authority of Busto (*l. c.*).

Sylvia passerina. [Species indeterminable.]

Sylvia passerina Lath.; Webb & Berthelot, Orn. Canarienne, 1841, p. 15; Bolle, J. f. O. 1854, p. 454.

S. passerina Temm.; Bolle, J. f. O. 1857, p. 282.

To begin with the name *Sylvia passerina* of Gmelin, Latham, and Temminck is absolutely indeterminable, though *Motacilla passerina* Gmelin has been fixed by Hartert on to the Garden Warbler, while in Latham's description the bird is said not to occur in England. What is beyond doubt, however, is that *Sylvia passerina*, as reported from the Canary Islands, refers to the *male* of *Sylvia conspicillata bella*, the Canarian race of the Spectacled Warbler.

Godman in his list of Migratory Birds of the Canaries and Madeira (Ibis, 1872, p. 175) transfers *S. passerina* Temm., as used by Webb & Berthelot and Bolle, to the Subalpine Warbler (*Sylvia subalpina* Temm.) without any apparent justification.

Hypolais polyglotta. Melodious Warbler.

Mompó is the first author to note this bird (Catálogo de las Aves de Tenerife, 1876, p. 247), and says "it builds its nests in the vines . . . . is a resident and very common." He must surely have confused it with the Chiffchaff.

Cabrera includes *Hypolais polyglotta* Vieill. (Catálogo, 1893, p. 42) on the authority of Mompó.

The Melodious Warbler occurs in Morocco, ranging to the Rio de Oro and extending as far south as Senegambia. Its presence in the Canaries as a rare visitor might therefore be expected.

Turdus viscivorus. Missel Thrush.

Busto is responsible for the inclusion of this species. It figures in his list (Topografia medica, 1864, p. 103) under the name of *Merula viscivorus*.

Cabrera mentions it in his list (Catálogo, 1893, p. 46).

If any Thrush visited the Canaries it would probably belong to the north-west African race *T. v. deichleri*. The typical form does not winter south of the Mediterranean countries.

Hylocichla ustulata swainsoni. Swainson's Thrush.

Polatzek (Orn. Jahrb. 1909, p. 125) mentions *Turdus swainsoni* Cab. on the authority of Busto, without any apparent justification.

Although Busto is apparently responsible for the inclusion of this species, I cannot find the bird mentioned in Busto's list. He mentions only *Turdus merula, musicus, pilaris, solitarius* and *Merula viscivorus* (Topografia medica, pp. 103, 104).

Turdus swainsoni of Cabanis is a north American species which has never occurred outside the New World.

Monticola solitarius. Blue Rock-Thrush.

Busto is the first author to mention this bird (Topografia medica, 1864, p. 104).

Cabrera gives it on the above authority (Catálogo, 1893, p. 46).

Luscinia luscinia. Eastern Nightingale.

First mentioned by Busto (Topografia medica, 1864, p. 103).

Cabrera gives it as *Lusciola philomela* Bechst. in his Catálogo, 1893, p. 44, on the authority of Busto.

Cinclus cinclus. Black-bellied Dipper.

Cabrera includes this bird in his Catálogo, 1893, p. 46, on the authority of Berthelot, whom he says cites this species.

I can find no mention of it anywhere in 'Ornithologie Canarienne,' however.

Troglodytes troglodytes. Wren.

Although Bolle in his paper (J. f. O. 1854, p. 454) cited above remarks that Ledru includes the Wren in his list, I cannot find any reference to it in Ledru's work. It is cited by Cabrera (Catálogo, 1893, p. 39), also Polatzek (Orn. Jahrb. 1909, p. 123) on the authority of Ledru, but he may have been simply quoting Bolle (*supra*). Webb & Berthelot do not mention the Wren in their 'Ornithologie Canarienne,' but Bolle notes that Berthelot, after first doubting its occurrence in the Archipelago, finally confirmed it verbally to him. Curiously enough, Bolle omits the species altogether from his final list (J. f. O. 1857).

Hirundo rustica savignii. Savigny's Swallow.

Cabrera wrote (Catálogo, 1893, p. 37) that *Hirundo savignyi* Steph. was particularly rare, an accidental visitor having been cited by Godman as shot in the island of Tenerife. He says he had a specimen in his collection killed in November at Laguna.

Godman does not mention this Swallow in his paper (Ibis, 1872).

Hartert (Nov. Zool. 1901, p. 307) went through Cabrera's collection in Tenerife in 1901 and could not find any skin of this species; he is convinced that Cabrera wrongly identified the bird he mentions.

Picus viridis. Green Woodpecker.

The Green Woodpecker is said by Cabrera (Catálogo, 1893, p. 35) to have been first mentioned in Viera's work (Diccionario de Historia Natural de las Islas Canarias, 1866). The description, however, on p. 176 under *Peto* (*Picus*) does not apply to the Green Woodpecker, but to the Pied, which is resident in Tenerife and Gran Canaria at the present day. Next it is included in Serra's 'Ornithologia Canaria' (according to Cabrera), but this work I have not seen.

Cabrera himself includes it as an accidental visitor on the authority of the above, noting that it is also included in Berthelot's book. This is not the case, however. Berthelot did not include the species in his 'Ornithologie Canarienne.' Considerable confusion seems to have taken place over this species.

Glaucidium siju. Cuban Owlet.

As shown by Tristram and Meade-Waldo, Koenig (J. f. O. 1890, p. 336) was badly hoaxed over this species (*Glaucidium siju* (D'Orb.)) by Ramon Gomez, the Orotava chemist and bird-stuffer. The bird was imported from Cuba! It appears in most authors' lists, but always (luckily) with the true explanation of its occurrence in the Canary Islands. *Cf.* Tristram and Meade-Waldo (Ibis, 1891, p. 616; 1892, p. 182; 1893, p. 186); Cabrera (Catálogo, 1893, p. 34); Hartert (Nov. Zool. 1901, p. 311); Polatzek (Orn. Jahrb. 1909, p. 119), etc.

Vultur ourigourap. Vulture.

Ledru (Voyage aux iles de Téнériffe, etc., vol. i. 1810, p. 178) is responsible for this bird's inclusion here.

Hartert rejects this Vulture from his list and points out (Nov. Zool. 1901, p. 306) that a confusion with the young of *N. percnopterus* has obviously taken place.

I cannot determine what *V. ourigourap* may be. Ledru gives a reference to Buffon, Pl. Enl. p. 427, and the bird depicted in this plate is a young *Neophron percnopterus*, doubtless the cause of the confusion.

Gyps fulvus. Griffon Vulture.

Busto is the author responsible for this bird's inclusion; it appears in his list (Topografia medica, 1864, p. 103).

Cabrera includes it (Catálogo, 1893, p. 29) on the authority of Busto, remarking that it is of accidental occurrence in the Archipelago.

Neophron pileatus. Vulture.

Ledru notes this species (Voyage aux îles de Ténériffe, etc., vol. i. 1810, pp. 178–179).

Cabrera includes it (Catálogo, 1893, p. 29), and remarks: "This species......is extremely rare in the Archipelago, where I have observed it without doubt in company with the last-named species [*N. percnopterus*]." He notes that Ledru cites it in his list.

Hartert (Nov. Zool. 1901, p. 306) rejects this species from the Canarian list.

Confusion with the young of *N. percnopterus* has surely occurred here.

Aquila maculata. Spotted Eagle.

Mompó gave this species in his list as having been observed in Tenerife (Catálogo de las Aves de Tenerife, 1876, p. 243).

Cabrera notes (Catálogo, 1893, p. 30) that Mompó includes *Aquila nævia* Briss., and remarks that he has doubtless confused it with *Buteo vulgaris* (*Buteo b. insularum*, the island form of the Common Buzzard).

Hartert refers to the bird (Nov. Zool. 1901, p. 306).

Astur gentilis. Goshawk.

Mompó (Catálogo de las Aves de Tenerife, 1876, p. 243) is the only authority for this bird's inclusion.

Cabrera mentions *Astur palumbarius* (Linn.) (Catálogo, 1893, p. 33) on the authority of Mompó.

Hartert (Nov. Zool. 1901, p. 307) points out the impossibility of the above record.

Milvus migrans. Black Kite.

Cabrera is the first author to mention this species, *Milvus niger* Briss. (Catálogo, 1893, p. 31), remarking that it is an irregular visitor. He had no specimens, and confusion with a dark example of *Milvus m. milvus* has probably taken place.

Polatzek wrote (Orn. Jahrb. 1909, p. 119) : "Occasionally passing through ; no specimens." He does not say that he was quoting Cabrera, but it certainly looks as if he was.

Falco æsalon. Merlin.

Ledru does not include this species in his list (Voyage aux îles de Ténérife, etc., 1810), as is erroneously stated by Cabrera [*supra*] and Polatzek (Orn. Jahrb. 1902, p. 118); neither does Viera include the Merlin in his Dictionary (Diccionario de Historia Natural, 1866), so far as I can make out.

Cabrera wrote (Catálogo, 1893, p. 32) that it was an extremely rare visitor, arriving accidentally from April to May. He noted that it was cited by Viera as well as Ledru !

Cabrera had no specimen, and does not say whether his observations are his own. Those cited by him seem to be non-existent, as already pointed out by Hartert (Nov. Zool. 1901, p. 307).

Falco naumanni. Lesser Kestrel.

First mentioned as a possible straggler to the Canaries by Bolle [*Falco cenchris,* J. f. O. 1857, p. 267].

Next it was (I am almost sure erroneously) recorded by myself from Tenerife, when I mistook for this species a small example of *Tinnunculus t. canariensis*, the island-race of the Common Kestrel, during my first visit of two days to this island in January 1904 (Field Naturalists' Quarterly, 1904, p. 249).

Phalacrocorax graculus. Shag.

Busto is the first to mention the Shag (Topografia medica, 1864, p. 105).

Cabrera says (Catálogo, 1893, p. 64) that *Phalacrocorax cristatus* Fabr. is more rare than the Cormorant, and notes that it is cited by Busto.

It is evidently this species which Polatzek intended (Orn. Jahrb. 1909, p. 133) under the non-existing name "*P. garrulus*." He includes and numbers it in his list of visitors, indicating that he considers it authenticated, but gives no particular reason for doing so.

As Busto and Cabrera are the only authors who mention this species, and as from his own account it appears that Polatzek never saw a specimen himself, I disagree with him in placing the Shag amongst the authentic visitors, and do not even consider it worthy of a place in Appendix A.

Sula sula. Brown Booby.

Under the name *Sula fulva* Vieill., Cabrera (Catálogo, 1893, p. 64) records a bird as "an accidental visitor according to Serra. I have met with two examples, killed on the coast of Tenerife, in the Scientific collection in the Capital."

In the first place there is no such name as *Sula fulva*, either of Vieillot or of any other author. It is most probably a misprint for *Sula fusca* Brisson = *Sula sula*.

I have not seen Serra's work and so cannot give the original and correct reference. If *S. sula* is indeed the species intended, the skins, if properly identified, were probably brought from the Cape Verde Islands.

Pelecanus onocrotalus. White Pelican.

Although Cabrera says of this species (Catálogo, 1893, p. 64), "This Pelican, which is an extremely rare visitor in the Canaries, has been cited by Berthelot from the Eastern Group," I have been unable to find any mention of it in Webb & Berthelot's 'Ornithologie Canarienne.' They may certainly have published the fact elsewhere, but Cabrera is the first author to include it in his regular list.

Polatzek mentions the Pelican and numbers the species in his list of visitors which have been authenticated, but remarks without any further reference: "It is said to have been seen on the Eastern island" (Orn. Jahrb. 1909, p. 132).

This is not very conclusive evidence that the Pelican has actually occurred in the Archipelago, although it is as likely to do so as many of the species enumerated in this Appendix.

Phaëthon aëtherius. Red-billed Tropic-bird.

According to Cabrera (Catálogo, 1893, p. 66) the first author to mention this bird is Serra (Ornithologia Canaria, 1879–1882), whose work has not been consulted.

Cabrera gives no further information about it himself.

Polatzek (Orn. Jahrb. 1909, p. 133) notes that Ramon Gomez, the Orotava chemist, told him that it was observed in former years. Gomez's word cannot be relied upon to any great extent—witness the Cuban Owl!

Ardea goliath. Giant Heron.

Serra (Ornithologia Canaria, 1879–1882), whose work I have not seen, is responsible for this record, according to Cabrera (Catálogo, 1893, p. 62), who includes *Ardea goliath* Brehm in his list on Serra's authority.

Anthropoides virgo. Demoiselle Crane.

Busto (Topografia medica, 1864, p. 104) notes this species in his work as *Ardea virgo.*

Cabrera includes it (Catálogo, 1893, p. 61) on the authority of Busto.

Hæmatopus ostralegus. Oystercatcher.

The Oystercatcher is first mentioned by Busto (Topografia medica, 1864, p. 105).

Serra, according to Cabrera, also includes it (Ornithologia Canaria, 1879–1882).

Cabrera remarks (Catálogo, 1893, p. 57) that it is an accidental visitor cited by Busto and Serra, but gives no further details.

Larus gelastes. Slender-billed Gull.

This Gull is first mentioned from Tenerife by Mompó (Catálogo de las Aves de Tenerife, p. 258). He mentions no specific occasion when it was taken.

Cabrera includes it (Catálogo, 1893, p. 66) on Mompó's authority.

Although the Slender-billed Gull might easily occur in the Canaries, it is more probable that the bird observed was *Larus ridibundus* in winter plumage, which somewhat resembles it at this season.

Larus minutus. Little Gull.

Mompó is again made responsible for the inclusion of this Gull in the Canarian list.

Cabrera includes it in his list (Catálogo, 1893, p. 66) on Mompó's authority, but I can find absolutely no reference to *Larus minutus* in the latter's work (Catálogo de las Aves de Tenerife, 1876).

Sterna albigena. White-cheeked Tern.

This Tern, *Sterna albigena* Licht., is included by Polatzek (Orn. Jahrb. 1909, p. 133) in his list of birds not properly authenticated; he notes that it is rare in the Archipelago, but does not say from whom he gets his information. He may have confused *Sterna senegalensis* Swains. (=*S. macrura*) and recorded by Cabrera (Catálogo, p. 67) with *Sterna senegalensis* Heugl. (=*S. albigena*).

In any case the record is worthless, *S. albigena* is extremely unlikely ever to have occurred.

Sterna paradisea. Arctic Tern.

Cabrera includes *Sterna senegalensis* Swains. apparently on his own authority (Catálogo, 1893, p. 67) as rarely occurring in the Canaries. He had no specimens and gives no further information. There is no reason why the Arctic Tern should not turn up in the Canary Islands in winter, but till now we have no authentic record of its having been found there.

Hydrochelidon nigra. Black Tern.

Mompó is responsible for the record of this species (Catálogo de las Aves de Tenerife, 1876, p. 258). His notes are merely general and do not refer to the bird in the Canary Islands.

Cabrera includes *Hydrochelidon fissipes* Linn. as an accidental migrant (Catálogo, 1893, p. 67) cited by Mompó.

Uria grylle. Black Guillemot.

Cabrera notes (Catálogo, 1893, p. 69) that Viera cites this species as an accidental visitor (Diccionario de Historia Natural de las islas Canarias, 1866).

Viera includes what he calls the "Tahoce (Uria)" on p. 269 of his Diccionario, but the long description which he gives does not fit the Black Guillemot. It is more like the Common Guillemot, but it may be noted that the "Tahoce" of the Canary Islanders to-day is the Madeiran Allied Shearwater (*Puffinus assimilis baroli*)!

Alle alle. Little Auk.

Mergulus alle (Linn.) was erroneously recorded by Godman (Ibis, 1872, p. 224) from the Canaries, who says "like many sea-birds this species is said to be more numerous in the eastern Canaries, though found occasionally throughout the group." Godman gives the references from which he obtains his information as "*Alca minor* Webb & Berthelot, Orn. Canarienne, p. 41; Bolle, J. f. O. 1855, p. 177." Now *Alca minor* of Brisson (who is the author quoted by both Webb & Berthelot and Bolle in their papers cited by Godman) is the Razorbill and not the Little Auk. Godman's error has been copied by Cabrera (Catálogo, p. 70), where he notes that the bird is included in his list on Godman's authority. This unfortunate mistake of Godman's has also led to the inclusion of the Canaries in the "General Distribution" of the Little Auk as given in the New B. O. U. List of British Birds, 1915, p. 280, where it is noted "In winter it visits the North Sea and Atlantic, being found occasionally in numbers as far south as the Canary Islands and the Azores." Godman (Ibis, 1866, p. 102) appears to have handled a specimen from the Azores—which he certainly did not do in the Canaries,—and the Azores Archipelago must be taken as the extreme limit of its southern range, and then only as an occasional straggler.

Macronectes giganteus. Giant Fulmar.

Appears to have been first mentioned by Serra (Ornithologia Canaria, 1879–1882) from the island of Tenerife.

Procellaria gigantea Gmel. is cited in Cabrera's list (Catálogo, 1893, p. 66) on Serra's authority. The usual range of this species is, according to Godman's Monograph (p. 262), south of the 30° S. latitude.

Diomedea exulans. Wandering Albatros.

According to Cabrera (Catálogo, 1893, p. 64), Serra in his work (Ornithologia Canaria, 1879–1882), which I have not seen, mentions that this Albatros has been killed in the Canaries.

The farthest north I have ever seen this species was lat. 18° 51′ S., long. 4° 43′ E., on 5 August, 1908, when returning from Cape Town.

Rallus aquaticus. Water-Rail.

First mentioned from the islands in Mompó's work (Catálogo de las Aves de Tenerife, 1876, p. 256), where it is said to be a bird of passage in winter and very rare; also, according to Cabrera (Catálogo, 1893, p. 60), it is noted by

Serra (Ornithologia Canaria). Cabrera includes it on the authority of these two authors.

Unfortunately it is erroneously stated to occur occasionally in the Canary Islands in the General Distribution of *R. aquaticus*, given in the B. O. U. List of British Birds, 1915, p. 301—a statement which needs correction in the next edition.

Pterocles alchata. Long-tailed Sand-Grouse.

The Long-tailed Sand-Grouse has been quoted by a number of authors as having occurred in the Canary Islands. Viera is, I believe, the first to mention it. It certainly is not found in the Archipelago at the present day, and I doubt very much whether it has ever been obtained as alleged by Cabrera, who wrote (Catálogo, 1893, p. 54) "it is a species which is met with only in the sandy plains of Fuerteventura." He does not appear to have had a specimen in his collection, and is probably only quoting from Viera's account. Bolle scouts the idea entirely (J. f. O. 1857, p. 333).

Polatzek, commenting on Cabrera's note, remarks that the only sandy plains in Fuerteventura are on the south of the island. He adds nothing in support of the bird's occurrence (Orn. Jahrb. 1909, p. 20).

In Ledru's List of the Birds of Tenerife, published in 1810, vol. i. p. 186, Mons. Sonnini adds a note to the effect that "Le Faisan" (*Phasianus colchicus*) is common in Fuerteventura and Lanzarote (!) Needless to say the Pheasant has never been heard of in either of these islands, but it is possible that later writers, knowing that a species of Sand-Grouse inhabited Fuerteventura, should have jumped to the conclusion that it was *P. alchata*, this being the bird which Sonnini believed to be a Pheasant.

Savile Reid (Ibis, 1888, p. 77) gives the most likely explanation of what may have given rise to the rumour.

Viera (Diccionario de Historia Natural de las islas Canarias, p. 306) gives a description of a *Pterocles* (which he calls *Lagopus pyrenaica*) of which the following is a translation: "A bird of the family of the Gallinules, and of the size of a

Partridge, whose beak is nearly straight, with the nostrils at the base of the upper mandible united to the feathers of the forehead. Its wings are long. From the tail start two feathers half as long again as the others, getting gradually thinner till they terminate in a point. The head, neck, and shoulders show several points and spots, which are black, greenish, and red, while the lower portion of the body is black. The feet are ashy, covered with a feathery down, claws black. On the throat are three black lines, like a necklace. It breeds in the island of Fuerteventura." Reid thus correctly translates the Spanish version which I have myself studied. Savile Reid comments that this description would seem to apply to *P. alchata* except that the abdomen is given as black as in *P. arenarius,* and suggests that both species may have occurred and the descriptions got mixed up. *P. arenarius orientalis* is, of course, the common resident species in Fuerteventura.

I think we may safely dismiss from our minds all likelihood of *P. alchata* having occurred in the Canary Islands.

Phasianus colchicus. Pheasant.

As already recorded under *Pterocles alchata*, the first mention of the Pheasant in the Canary Islands comes from Sonnini who, in Ledru's List of the Birds of Tenerife, vol. i. 1810, p. 186, adds a note to the effect that "Le Faisan" (*Phasianus colchicus*) is common on "Lancerote et à Fortaventura."

We next find "*Gallus phasianus*" appearing in Busto's extremely unreliable list (Topografia medica, 1864, p. 104).

Numida sp. Guineafowl.

Busto (Topografia medica, 1864, p. 104) includes a *Meleagris* in his list. If Guineafowls ever inhabited the Canary Islands—which is extremely unlikely—they must have been imported from the Cape Verde Islands, or from the mainland, where they are numerous. The record is worthless.

X.—*A Contribution to the Ornithology of the Island of Texel.* *By* Lieut. CLAUD B. TICEHURST, R.A.M.C., M.A., M.B.O.U.

As a good many Englishmen have at one time or another visited the Island of Texel during the nesting-season, to see the Avocets, Black-tailed Godwits, and other birds which breed there, I thought it might be of interest to publish the notes of two expeditions to the island made by Mr. Bonhote and myself during the autumn migration in 1906 and 1908. To our notes I have added records made during the nesting-season by various authors in order to make the list of species as complete as possible, though inability to hunt up all records precludes this paper from being anything like complete. Our first visit lasted from 24 August to 3 September, 1906, and the second from 15 September to 10 October, 1908, Mr. Bonhote being alone part of the time. He has already dealt with the results of our observations solely from the point of view of migration *.

The following papers are alluded to :—

1. J. P. Thijsse's List of Breeding Species reprinted in Norf. and Norw. Trans. v. pp. 172–4 : abbreviated as (Th.). The date of this list is prior to
2. "Eien Besuch bei den Brutvogeln der holländischen Nordseeinseln," by O. Leege-Juist : Ornith. Monatsb. xxxii. p. 357, &c. : abbreviated as (L.J.). The date of this visit was 1906.
3. A short Account of a Spring Visit, which appeared in the 'Field,' 23 October, 1909 : by Mr. Davies.
4. A Visit to a Dutch Sanctuary, with Notes on the Bird-Life of Texel Island, by M. Vaughan, M.A., M.B.O.U., Norf. and Norw. Trans. x. pp. 107–125 : abbreviated as (V.).

In addition to these papers, Messrs. Charles Pearson and H. L. Popham have given me a few notes on the birds seen during a spring visit to the island over ten years ago. It is uncertain how much of Leege-Juist's material on Texel birds was from first-hand knowledge and how much gathered from other sources. Mr. Daalder, the schoolmaster at Oosterend, supplied me with some information, which, though mainly correct, I think, I cannot vouch for. Referred to as (D.).

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* 'Ornis,' 1910.

The Island of Texel is the largest and most westerly of the chain of Dutch Friesian Islands lying off the north coast of Holland. The other islands going eastward are Vlieland, Terschelling, Ameland, Schiermonnikoog, and Rottum, and to the east of the last lie the German chain of islets—Borkum, Juist, Norderney, &c. On the North Sea side of Texel the island is bounded by undulating sand-dunes, in many places a mile wide, in the hollows of which are small reed-girt lakes and shallower pools in various stages of evaporation. The dunes are covered with marram and other grasses, while brambles, sea-buckthorn, &c., occur in patches.

Bird-life here is scarce as regards the smaller species, and since the difference between high- and low-water mark is comparatively small and the foreshore is plain sand, the locality is not suited to the requirements of Waders. On the Zuyder Zee side of the island the main sea-wall keeps the sea out from the polders and grass-land. Between Oosterend and De Cocksdorp is the vast sand-flat called the Vlakte van Kerken, with a good many muddy channels, while between the sand and the sea-wall is a fair-sized strip of "puzzle-weed" (sea-grass, sea-daisy, sea-lavender, &c.). With a strong S.W. wind the tide here comes right up to the sea-wall, at other times it only comes up the channels, the main high-water mark being a long way out on the sands; indeed, at times anyone might stand on the sands and hardly be able to discern where high-water mark is. At low-water mark merely a channel is left between Texel and Vlieland, which is visible on the horizon though only about five or six miles distant. It is on these sand-flats that masses of sea-birds of various kinds collect during the autumnal passage, to whose migrations we paid special attention. Of the interior of the island I can say but little, as I did not traverse it very much. The greater part of it appeared to be grass and agricultural land, intersected with innumerable dykes, and here and there a few plantations; the polders or more recently reclaimed land I need not describe, as they are well known.

A good many of the resident species of birds did not come under observation, as we very seldom, if ever, visited suitable localities for them, while some of the summer visitors had apparently departed before our visit.

If every record is accepted, the number of species which breed on Texel is 101. Of these, four—the Cormorant, White Stork, Spoonbill, and Common Gull—undoubtedly used to breed, but have now gone; while ten—the Marsh-Tit, Goldfinch, Great Grey Shrike, Stone Curlew, Little Owl, Barn Owl, Goshawk, Pochard, Widgeon, and Great Black-backed Gull—rest on Thijsse's authority only. Possibly some are included erroneously and others were but single instances (in which category the Woodchat may also be put), as no one, so far as I am aware, has met with them since. Of one—the Pintail—there is a certain amount of evidence to show that it was introduced. In addition to these, it is probable that three more breed, or have bred—Stock Dove, Nightingale, Stonechat—according to Mr. Vaughan, who also is the sole authority for the occurrence of the Purple Heron and Short-toed Lark.

Concerning one or two other species information does not seem very certain. The total number of birds noted for Texel in this paper is 144, but of course there are many others which I was informed occur on migration and doubtless do so, such as the Shore-Lark, Snow-Bunting, Bluethroat, Peregrine, &c.

SONG-THRUSH.

Several seen in August 1906 in the old duck-decoy at Oosterend and an odd bird in the village. First arrivals on the sea-wall at the north end on 25 and 26 September, followed by many more, 5–9 October, 1908. Breeds (Th.), but not common (L.J. & D.). Absent from the other islands as a breeding species (L.J.).

REDWING.

First arrivals on 3 and 4 October, followed by many more on 5–10, 1908.

FIELDFARE.

"Seen on spring migration" (V.).

BLACKBIRD.

Arrived at much the same time as the Song-Thrush; increased in numbers on 10 October, 1908; not seen in 1906. "Rare as a breeding species, common as a migrant" (D.). "Breeds" (Th.), "but not common; single pairs breed on Ameland also" (L.J.).

RING-OUZEL.

Two examples on the northern sea-wall on 24 September, another on the 26th, 1908; several in the Thrush migration early in October.

WHEATEAR.

A few still to be seen along the banks and roadsides at the end of August 1906, but no migratory movement noted. In September 1908 notably increased numbers were recorded for the 22nd and 24th, which quickly passed on, and a few were seen to arrive from the north-east over the water on the 25th. "Breeds commonly" (D.). "Breeds" (Th.). "Also on all the other islands" (L.J.). Those we met with were of the common race.

STONECHAT.

"Probably breeds" (V.).

WHINCHAT.

Not uncommon in August 1906 in the dunes in Slufterbollen, a few also in the cultivation. "Breeds fairly commonly on Texel and the other islands" (L.J.).

REDSTART.

Odd birds noted from 20–24 September, on which date there was a distinct increase, after which only single birds were seen up to 1 October and one on the 8th. "Rare as a breeding species, common as a migrant" (D.). "Single pairs breed" (L.J.).

ROBIN.

One 28 September, noted again 8 and 9 October. "Rare as a breeding species, common as a migrant" (D.). "Breeds" (Th.). "Single pairs breed" (L.J.).

NIGHTINGALE.

"Occurs; probably bred in 1913" (V.).

COMMON WHITETHROAT.

Common in August in the dunes and in general where there are low bushes; family party seen on 26 August. On 20 September I saw one crouching under some drift-weed on the shore at the north-east end; a very tired bird. "Common as a breeding species" (D.). "Breeds" (Th.). "Also on all the islands except Rottum" (L.J.).

LESSER WHITETHROAT.

"Common as a breeding species" (D.). "Only single pairs on Texel. Heard on Vlieland and a nest found on Terschelling" (L.J.).

BLACKCAP.

One in the "puzzle-weed" at the north end 19 September; very tired. "Fairly common in the gardens and park at Den Burg; absent from the other islands" (L.J.). "Breeds" (Th.).

GARDEN-WARBLER.

"Common as a breeding species" (D.). "Breeds" (Th.). "Everywhere in gardens and plantations; also breeds on Terschelling" (L.J.).

GOLDCREST.

On the morning of 25 September, during fog, the gardens at Oosterend were full of Goldcrests and Blue Tits, which later in the day vanished. New arrivals were noted on 6 and 7 October. "Has been erroneously recorded as breeding on Texel" (L.J.).

WILLOW-WREN.

Several, including a family party, seen in the sand-dunes on 26 August; a Warbler, perhaps of this species, seen to arrive—flying low over the water—on 24 September from the north-east, and odd birds were noted on the 25th and 27th. "Rare as a breeding species, common as a migrant" (D.). "Breeds" (Th.). "Not common, breeding on Texel; also seen on Schiermonnikoog" (L.J.).

CHIFFCHAFF.

"Breeds" (Th.). "Status as last" (D. & L.J.). "Also breeds on Schiermonnikoog" (L.J.).

ICTERINE WARBLER.

Said to breed in the old decoy, where I saw a disused nest in 1906. All had gone by 31 August. "Generally distributed; many in the disused decoy" (V.). "Common as a breeding species" (D. & L.J.). "Breeds" (Th.). "Also breeds on all the other islands" (L.J.).

REED-WARBLER.

One seen in a reed-bed by the sea-wall at the end of August. "Common as a breeding species" (D. & L.J.). "Breeds" (Th.). "Scarce on Schiermonnikoog" (L.J.).

GREAT REED-WARBLER.

"Single pairs breed in reed-beds of last year's growth on Texel only" (L.J.). "Breeds" (Th.).

MARSH-WARBLER.

Both these species are said by Daalder to be fairly common and to breed in the old decoy; they did not come under notice when we visited the place on 31 August, and probably had already migrated. Vaughan remarks that the former was said to occur, but he could not obtain any evidence of it, while the latter bred in 1914. Leege-Juist records the Marsh-Warbler on Texel only; fairly common at Waalenburg and in the wetter part of the dunes at the north end.

SEDGE-WARBLER.

"Rare as a breeding species, common on migration" (D.). "Single pairs breed on Texel; not recorded from the other islands" (L.J.).

GRASSHOPPER-WARBLER.

"Bred in 1913" (V.). Heard near the dunes in 1909 by Mr. Davies. "Breeds on Juist, one of the German North Sea islands" (L.J.).

HEDGE-SPARROW.

"Breeds" (Th.), "but rather rare" (D.). "Single pairs breed in the park at Den Burg, absent from the other islands" (L.J.).

GREAT TIT.

Heard once in August in Oosterend. "Not common as a breeding species, commoner as a migrant" (D.). "Breeds" (Th.). "Not common; absent from the other islands" (L.J.).

BLUE TIT.

Odd birds on several occasions in August in the gardens at Oosterend; an increase of migrants (with Goldcrests) noted on 24 September. "Status as last" (D. & L.J.). "Breeds" (Th.).

MARSH-TIT.

"Breeds" (Th.).

WREN.

One in the old duck-decoy on 31 August. "Common as a breeding species" (D.). "Breeds" (Th.). "Fairly common also on Terschelling and Schiermonnikoog" (L.J.).

TREE-CREEPER.

"Single pairs breed regularly on Texel in the Park" (L.J.).

WHITE WAGTAIL.

Fairly common up to the end of August, with increase of migratory birds up to 1 September; odd birds on several days, 19 September to 5 October, 1908. "Common as a breeding species and on migration" (D.). "Breeds" (Th.). "Common on all the islands; the Pied Wagtail bred on Juist in 1904" (L.J.).

BLUE-HEADED WAGTAIL.

Seemed fairly common at the end of August. Distinct migration on 1 September. In 1908 single birds noted on 15 and 30 September. "Status as last" (D.). "Breeds" (Th.). "Very common on all the islands" (L.J.).

TREE-PIPIT.

One on 27 September, 1908. "Rarely breeds" (D. & L.J.). "Breeds" (Th.). "Also breeds on Terschelling and Ameland" (L.J.).

MEADOW-PIPIT.

Common, and became more numerous towards the end of August. On 25 September I saw some arriving from the north-east across the water and flying low; they settled at once and began to feed; the species came under observation each day with notable increases in numbers, which soon passed, on 22 September and 5 October. "Common as a breeding species and on migration" (D.). "Breeds" (Th.). "Very common on all the islands" (L.J.).

ROCK-PIPIT.

Evidently does not breed on the island, as we saw none in August. The first migrants appeared on 29 September, with additions to their numbers on 6 and 10 October. "The Water-Pipit is recorded as having bred on Borkum by Prof. Schneider; probably an error for this species" (L.J.).

TAWNY PIPIT.

Said by Daalder to breed in the dunes at Slufterbollen, though scarce, where, however, on 26 August we failed to see any. "Breeds" (Th.). "Seldom breeds, though common on the mainland dunes" (L.J.).

RED-BACKED SHRIKE.

A single young bird seen at the end of August. "Not common as breeding species" (D.). "Breeds" (Th.). "Regularly in single pairs; also breeds on Terschelling and Ameland"(L.J.).

GREAT GREY SHRIKE.

"Breeds" (Th.).

WOODCHAT-SHRIKE.

"Bred in June 1900 on Texel. Baron Snouckaert von Schauberg received two eggs from there" (L.J.).

GOLDEN ORIOLE.

"Seldom breeds" (D.). "Breeds" (Th.). "Nested in a wood near the haven, as recorded by R. Fortune" (V.). "A pair regularly nest in the Park at Den Burg ; formerly two pairs" (L.J.).

WAXWING.

This bird is well known on the island, and is called the "Post-vogel" as its occurrence is thought to herald disease. Each little spinny on the island is let for snaring birds (Thrushes &c.), and this snaring is done in a peculiar way. A triangle is made of a thin willow branch, and to each side of this are affixed horse-hair snares, so that they overlap in the centre of the triangle ; at the middle of the base of the triangle is affixed a bunch of rowan berries (which are harvested for this purpose). The triangle is then hung up on a prominent bough of a tree. Each spinny may contain about fifty such triangles, which must not be less than three feet from the ground nor set before 1 October. Indeed, it would not be of much use to set them earlier, as the migratory Thrushes, Blackbirds, Fieldfares, &c., do not put in an appearance before that date. When Waxwings come they are also constantly caught.

PIED FLYCATCHER.

One on migration 1 September, one seen 25 September. "One male seen May 1914" (V.).

SPOTTED FLYCATCHER.

One seen 31 August, one on 27 September. "Not common as a breeding species" (D.). "Breeds" (Th.). "Fairly common on Texel; also breeds on Terschelling, Ameland, and Schiermonnikoog" (L.J.).

SWALLOW.

Was still common up to the end of August. Noted on most days in September in small numbers. On 26 September it was passing south along the sea-wall all day; last noted on 3 October. "Common as a breeding species and on migration" (D.). "Breeds" (Th.). "Very common; also breeds on all the other islands" (L.J.).

HOUSE-MARTIN.

Seen nearly every day in the village, but in no great numbers, up to the end of August 1906. Single passing migrants noted on 26 and 27 September were alone observed in 1908. "Breeds commonly" (D.). "Breeds" (Th.). "Less common than the Swallow on Texel; also breeds on Terschelling, Ameland, and Schiermonnikoog" (L.J.).

SAND-MARTIN.

A few seen on several occasions. No colonies met with and likely breeding-places few; possibly the birds may use a suitable artificial bank; one near the old decoy was said to be utilized by them. "Common in some places and in some years" (D.). "Breeds" (Th.). "Several small colonies at the north and absent from the other islands" (L.J.). Davies records a large colony near De Cocksdorp in a low turf-wall.

GREENFINCH.

Two near the village in August. "Not common as a breeding species" (D.). "Breeds" (Th.). "Isolated pairs in gardens in Texel only" (L.J.).

HOUSE-SPARROW.

Common in August and September; at the beginning of October there seemed to be increased numbers. "Common breeding species" (D.). "Breeds" (Th.). "Also breeds on all the other islands" (L.J.).

TREE-SPARROW.

One seen near the village in August. "Common breeding species" (D.). "Not common; also a few pairs on Schiermonnikoog" (L.J.).

CHAFFINCH.

Not noted in August, when only one spinny was visited. At the end of September we saw fair numbers each time we visited the spinnies, and there seemed to be an influx on 27 September and again on 6 and 9 October. "Common as a migrant" (D.). "A few pairs nest in the bushes on the dunes; also single pairs on Schiermonnikoog in the park" (L.J.).

BRAMBLING.

First seen on 27 September among a party of immigrant Chaffinches. Odd birds seen at the beginning of October with an increase on the 9th.

GOLDFINCH.

"Breeds" (Th.). "Has bred on Borkum, one of the German islets" (L.J.),

LINNET.

Fairly common in flocks in August; in September and October this species was always present; an increase noted on 20 September; on 23rd flocks were passing south-east along the coast till 10 A.M., after which time no movement was seen. Further temporary increases in numbers were noted on 29 September and 10 October. "Common breeding species" (D.). "Breeds" (Th.). "Common on all the islands" (L.J.).

REED-BUNTING.

One or two seen on the dunes and fields near Slufterbollen in August; it did not seem at all common, but nestlings were noted: we saw none in September (possibly they had departed), and three seen on 4 October were doubtless migrants. "Common breeding species" (D.). "Fairly common on the dunes of Texel, where reeds and brambles grow together" (L.J.).

YELLOW BUNTING.

"Breeds" (Th.). "Single pairs breed at the foot of the dunes on Texel" (L.J.).

STARLING.

By far the commonest Passerine bird noted in August; very common in the village and surrounding fields and farms and even out on the puzzle-weed of the shore, miles from any house. Noted each day in September and October, with temporary accessions to the numbers on 20–22 September and 5 and 10 October. "Very common breeding species and migrant" (D.). "Breeds" (Th.). "Breeds numerously on all the islands" (L.J.).

MAGPIE.

One or two in the village in August; noted on several days in September, but not in any numbers. Our visits, however, to suitable places were not frequent. "Common as a breeding species" (D.). "Breeds" (Th.). "Single pairs breed in Texel in all the village parks, also in bushes on the dunes, where a nest was found in a white-thorn three feet high" (L.J.).

JACKDAW.

A migrant, on 9 October, was the only individual met with. "Common on migration" (D.). "Single pairs breed in the towers every year on Texel; absent from the other islands" (L.J.).

HOODED CROW.

First noted on 6 October, with an increase on the 9th.

CARRION-CROW.

"Common breeding species" (D.). Thijsse mentions a nest very low down in a white-thorn on the dunes. Leege-Juist records it as not very common on Texel, nesting in the decoys and on bushes in the dunes; also in the decoys at Terschelling and Vlieland, where a nest was found on a horizontal plank of a wind screen, five feet from the ground; he considers it commoner on Ameland, where it breeds in high trees; he also records nests on a church tower and on the gable of a church roof there.

ROOK.

One seen on 27 September. "Many small colonies up to ten pairs on Texel only" (L.J.). "Common breeding species" (D.). "Breeds" (Th.).

SKYLARK.

Common on the grass fields, dunes, and "puzzle-weed" on the shore during August. Noted each day in September and October, with an increase on 22 and 24 September, but it appeared to pass on. Some seen arriving from the north-east across the water on the 24th and 25th—the latter a foggy, still day. "Common breeding species and migrant" (D.). "Breeds" (Th.). "Very common on all the islands" (L.J.).

CRESTED LARK.

Said by Daalder to breed, though rarely, in the dunes at Slufterbollen, where, however, we did not meet with it on 31 August. "Breeds; nest built on roof of a barn" (Th.). "Single pairs nest in the dunes" (L.J.). "Doubtful as a breeding species" (V.).

SHORT-TOED LARK.

"One pair seen April 1914" (V.).

SWIFT.

"Rare breeding species" (D.). "Breeds" (Th.). Apparently all gone by 24 August, for we saw none. "Single pairs breed in the church tower at Oosterend; absent from the other islands" (L.J.).

KINGFISHER.

Several seen in August; two on the shore on the 29th. "Rare breeding species" (D.). Daalder found a nest in 1902 and saw one or two pairs elsewhere. "Commoner on migration" (L.J.).

CUCKOO.

Not uncommon in August; a distinct immigration of young birds on 1 September, when I saw six or seven in the course of a short walk. "Not common as a breeding species" (D.). "Breeds" (Th.). "Frequently breeds on all the islands" (L.J.).

SHORT-EARED OWL.

"Not uncommonly breeds" (D.). "Breeds on the sand-dunes" (V.). "Breeds yearly on the dunes; has also bred on Vlieland and Schiermonnikoog" (L.J.).

LITTLE OWL.

"Rarely breeds" (D.). "Doubtful" (V.). "Has repeatedly bred on Nordeney, one of the German group of islands" (L.J.).

BARN-OWL.

"Breeds" (Th.).

MARSH-HARRIER.

Several seen on the dunes at Slufterbollen, including a family party on 26 August; they were quartering the ground for young toads and frogs, which were numerous and of which we found several remains, the heads, legs, and backbones being left. "Nests not uncommonly in the small lakes in the dunes" (D.). "Probably disappeared with the drainage of the Den Horn marshes" (V.). "Single pairs nest regularly on the dunes" (L.J.).

MONTAGU'S HARRIER.

"Breeds on the sand-dunes" (V.). "Single pairs breed on the dunes on Terschelling and Ameland, also on Schiermonnikoog" (L.J.).

BUZZARD sp.?

Two seen circling high overhead on 22 September, migrating.

GOSHAWK.

"Nest in an old rook's nest in a birch-tree of no great height" (Th.). "Very doubtful" (V.).

KESTREL.

Not uncommon, seen hawking over the marshes and fields in August, and stooping at a Dunlin on the shore. Noted on many days in September and October, but not evidently migrating except on 25 September, when I think some arrived. "Common as a breeding species" (D.). "Breeds" (Th.). "Nests in old crows' nests, water-mills, and towers" (L.J.).

SPARROW-HAWK.

One seen on 9 October, a migrant.

MERLIN.

Single birds seen 25 and 28 September and 9 October.

CORMORANT.

A large flock always to be seen on a point of sand at the north-east end during August. Noted daily in September and October, often in masses sitting on the sand along the tide's edge; increase in numbers on 29th, but numbers diminished on 8 and 10 October. "A colony nesting in trees in company with herons at one of the decoys" (D.). "Nests in trees round the decoys" (Th.). "Up to 1904 six pairs bred in a decoy at Oudeschild; formerly also in some copses. Now exterminated" (L.J.).

WHITE STORK.

Not met with. Daalder informed us it seldom occurs as a migrant, but occasionally a pair or two have nested.

"Breeds" (Th.). "Does not breed on the island now, seldom, if ever, occurs" (V.). "Formerly eight or ten nests; in 1905 only one, at Hoorn on a barn" (L.J.).

BLACK STORK.

An adult met with on 31 August on the shore. Mr. Trapp, a native who collects for the Dutch museums, told us that the bird had only been met with a few times on the island.

SPOONBILL.

On 25 August, a very windy day, flocks of Spoonbills were continually flying up and down the tide-mark at the north-east end, otherwise they spent the day well out on the sand-bank, looking like a white cloud in the distance. Over eighty were counted on 15 September and fifty on the 19th, after which numbers fell off rapidly, and the last was seen on the 26th, except for an odd bird on 7 October. Daalder told me they were common on migration, and that occasionally a pair or two bred in the lakes of the sand-dunes; but that the nearest colony was at Zwanewater, near Calantsoog, south of the Helder. "Formerly bred in numbers before the drainage of their haunts in the southern dunes; in 1905 one nest at Oudeschild in a reed-bed" (L.J.). "Has not bred since the draining of the marshes near Den Horn; stray birds seen especially in May and June" (V.).

HERON.

Common in August, often coming out from the marshes to the shore at dusk; noted each day in September and October, with increased numbers on 7 and 8 October. "Nests in the trees at one of the decoys" (D.). "Breeds" (Th.). "Breeds, but not numerously, in trees and reeds" (L.J.).

PURPLE HERON.

"Rare; does not breed" (V.).

GREY GEESE.

Noted on 15 September, and on most days, on or flying over the shore, also seen on a small lake in the dunes. The numbers gradually increased, notable additions being on

21 and 29 September, 2 and 10 October. We were never close enough to determine the species, except that they did not appear to be White-fronted. They have a way of getting geese in winter on the island by going out with strong head-lights; the geese are said to be dazzled by them, and admit of a near enough approach for a shot. Grey Lag recorded for "April 1914" (V.).

BRENT GOOSE.

First appeared on 1 October, with an increase on the 10th. Said to be common in winter. "Assembles in big flocks on coast before migration" (V.).

SHELDUCK.

Family party seen on several occasions in August. Noted nearly every day in September and October. Apparently a sedentary species. "Breeds not uncommonly in rabbit-holes on the dunes at De Cocksdorp" (D.). "Breeds" (Th.). "Sometimes breeds also in the sheep-folds or under straw or hay-stacks" (L.J.).

MALLARD.

Very common in the polders and on the lakes at Slufterbollen. Apparently the home-bred stock frequently interbreeds with farmyard ducks and white call-ducks. On one lake we put up four separate masses of fowl, mostly Mallards; each flock rose with a roar of wings and momentarily appeared to darken the sky. A not uncommon variety was one in which the chestnut breast-band of the male was replaced by grey vermiculated feathers, the black under tail-coverts also being marked with grey vermiculations. I noted a similar bird in the Rotterdam Zoological Gardens, which Herr Büttikofer informed me was the produce of *boschas* × *domesticus* cross. I have seen similar birds in a farmyard in Kent, and once examined an individual shot near Yarmouth*.

There are, I believe, three decoys worked on Texel, but we only visited an old disused one in a small wood, the traces of four pipes still being visible, though quite choked with reeds. In order to start a decoy, it is necessary first to get sanction and then a licence, which is renewable every year: if this is allowed to lapse, it apparently cannot be renewed again. "Breeds commonly" (D.). "Common on all the islands" (L.J.). "Breeds" (Th.).

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* Erroneously recorded as a hybrid by Mr. Patterson in the 'Zoologist,' 1916.

SHOVELER.

Several seen amongst the other ducks on two lakes in the dunes at Slufterbollen 26 August. Also noted 28 August and 3 October, but as this species does not frequent the shore, it did not come much under our notice. "Breeds commonly" (D.). "Breeds" (Th.). "Noted, three nests found" (Davies). "Common, but no records from the other islands" (L.J.).

PINTAIL.

A flock seen on the saltings 21 September and a single bird on the 26th. Pintail's nests have been found three times by Daalder, two of them in 1905 (as he informed me); he said that they were common in winter and are taken in the decoys. But it must be remembered that on the decoys at Terschelling and Ameland, neighbouring islands, half-tame decoy Pintails are kept and frequently breed (L.J.), and the same may be the case on Texel. "Breeds" (Th.).

TEAL.

Some were seen on a lake at Slufterbollen on 26 August and several lots on the shore on 25 August. Not noted in September till the 21st; numbers greatly increased on the 25th, after which the bird was noted each day. Daalder says that it does not breed on the island, but is very common in winter, hence its Texel name of "Wintertaling," as opposed to the Garganey "Zomertaling." On the other Friesian islands odd pairs are recorded as breeding on Ameland, Borkum, and Juist. "Breeds" (Th.). "Rather scarce" (V.).

GARGANEY.

Flocks noted in the Polder het Noorden at various times in August, also on a lake at Slufterbollen. Apparently gone by 15 September. Recorded as breeding commonly by Daalder, not mentioned in Thijsse's list. "Seen in the breeding season" (Davies). Nest found in 1905 by Mr. Charles Pearson. "Fairly common; has also bred on Terschelling" (L.J.).

WIDGEON.

Some noted at Slufterbollen on 26 August. Seen on the shore on most days in August, September, and October; very large increase in numbers together with Teal on 25 September. "Common migrant" (D.). "Breeds" (Th.). I seem to recollect being told that a nest had once been found.

POCHARD.

"Breeds" (Th.).

SCAUP.

One observed 29 September. "A pair were seen in June 1906 by Dr. Van Oort, but it was not proved that they were breeding" (L.J.).

[EIDER.

So far as I know unrecorded for Texel, but three nests were found on Vlieland, the next island, by Leege-Juist in 1906—the first breeding record for Holland.]

MERGANSER.

Odd birds noted on 28 and 29 September and 5 October; increase in numbers on 10 October.

WOOD-PIGEON.

Numerous in August in the disused decoy, where the trees were full of old nests. One pair at least had bred on the ground. A few pairs breed in the trees in the village. Odd birds noted in September, but as suitable places were rarely visited, this species did not come under observation much, and there was no evidence of any migratory movement. "Breeds" (Th.). "Breeds in all the spinnies, including the decoy" (L.J.).

STOCK-DOVE.

According to Leege-Juist, this has been erroneously recorded as a breeding species on Texel. Baron Snouckaert van Schauburg says it breeds in rabbit-holes in the dunes on the Dutch mainland, but not on Texel. "Probably breeds" (V.). We did not meet with it.

TURTLE-DOVE.

"Breeds in the dwarf woods at the foot of the dunes; not rare" (L.J.). "Breeds" (D. & Th.). We did not meet with it; possibly already gone further south by 25 August.

QUAIL.

"Not common, in the meadows principally near Oosterend" (L.J.). "Breeds" (D. & Th.). "Pheasants have been introduced on Schiermonnikoog, otherwise neither Pheasants nor Partridges occur on the Dutch Friesian Islands" (L.J.).

CORN-CRAKE.

"Breeds numerously in the Polder Eieland, a few at Oosterend" (L.J.). "Breeds" (D. & Th.).

WATER-RAIL.

"Very rare. Daalder found a nest in the second half of May 1906 in a polder north of Oosterend which contained two eggs" (L.J.). One seen 9 October.

MOORHEN.

Odd birds seen in September when suitable places were visited. "Breeds numerously in the undrained reed-beds" (L.J.). "Breeds" (D.).

COOT.

The same remark applies to this species. "Breeds" (Th.).

STONE CURLEW.

Given as a breeding species by Thijsse only. Vaughan thinks that this is a mistake, as there is no suitable ground, but I think that in the dunes, where the winter's flood-water has dried off and has left flat, bare ground, there might be found suitable places for this species. We did not, however, meet with it.

Ringed Plover.

Fairly numerous, but not so common as the Kentish Plover. Small flocks were always to be seen in August on the sands, foreshore, and banks of the ditches in the Polder het Noorden. Noted each day in September and October in varying numbers. On 22 September a flock passed high over the island going south-west. "Nests only rarely, in the polders and on the shore" (L.J.). "Breeds, but common as a migrant" (D.). Pearson saw a pair in Hendrick's Polder on 26 May, 1905, where he supposed they were breeding.

It is somewhat remarkable that this species should be so rare as a breeding species, not only on Texel but on all the West and East Friesian Islands, its place being taken by the Kentish Plover, whereas on the North Friesian Islands exactly the opposite obtains. "Probably also nests on Terschelling" (L.J.).

Kentish Plover.

On 26 August we saw young in the dunes at Slufterbollen hardly able to fly; they were numerous on the shore, preferring the drier sand near the "puzzle-weed"; a large increase in numbers on 1 September, on which day they swarmed, two huge flocks being seen. Odd birds were noted in the dykes of the polders. By 19 September there were very few and these were new arrivals, and the last were seen on 21 September. "Breeds commonly" (D. & L.J.). "Nests found in the Polder het Noorden" (Pearson). "Polder het Noorden, also on dried mud near the dunes; nests lined with broken cockle- and clam-shells and bleached sheep-droppings" (Davies). "Breeds on all the Dutch Friesian Islands" (L.J.).

Golden Plover.

Small parties noted on the shore on 27 August, on which day the first arrived, and each day after this others followed. In September and October flocks were seen on the shore every day, with large accessions to the numbers on 21 September and 10 October. A large flock also noticed in the grass-fields near the dunes on 20 September. The stomach of one contained small gasteropod shells. Does not breed on the island, but some were seen on 26 May, 1905, by Mr. Pearson on Hendrick's Polder.

GREY PLOVER.

Large flocks already on the sands by 25 August and noted every day. Adult birds still in full summer dress seen, generally singly. Observed each day in September and October, but by 19 September the adults appeared to have gone. An increase in numbers on the 21st, and on the 25th we saw large flocks arriving high up from the north-east. Further increase on 28th, after which the numbers fell off considerably, but there were further arrivals on 10 October. Small crabs noted as food of this species. "A few odd birds in nuptial plumage during the breeding season" (V.).

LAPWING.

Very common everywhere inside the sea-walls. Noted each day in August and September, the numbers increasing in October. The taking of Lapwings' eggs forms one of the industries of the island. Both the Dominion land and the private land is let each year, the former by public auction, for the purpose of the egg harvest. Each strip of land costs 20 to 30 guilders in rent according as to whether it is a good place or not. The season lasts from the first laying, about 23 March, till 1 May, after which no eggs are allowed to be taken. As a consequence of this arrangement, the Lapwing is increasing, since from the later sittings a larger percentage of young are reared, doubtless owing to the less inclement weather. The first dozen or so eggs are always sent to the Royal Household of Holland and fetch $1\frac{1}{2}$ to 2 guilders each. The price rapidly drops, however, to 1, $\frac{1}{2}$, $\frac{1}{4}$ guilder, and the average price, taking the season through, is 12 cents each. About 5000 guilders are received in Texel annually for Plovers' eggs, Friesland being a rival in the industry; from this it would appear that about

60,000 eggs are exported every year, as well as those of the Redshank and Black-headed Gull. "Breeds on all the Dutch Friesian islands" (L.J.). "Breeds" (all authors).

TURNSTONE.

Fairly numerous on the shore in August, occasionally noticed on the dykes in the polders. No very large flocks seen, and all appeared to consist of young birds. I saw one flying along with a live cockle attached to one of its toes; it had trodden on the cockle when the latter was open and was thus trapped. Some noted in September till the 21st, when numbers diminished; a few left on the 25th and 28th, after which only a single bird on 5 October was seen. "Noted on spring migration" (V.). "Common on migration" (D.).

OYSTERCATCHER.

Two pairs on 27 August still had young unable to fly. Perhaps the commonest wader on the shore in August and September; we might almost say, without fear of exaggeration, that there were "miles of Oystercatchers!" Towards the end of September and beginning of October the numbers decreased gradually. Besides frequenting the sands and cockle-beds, this species was frequently to be seen in August in the fields and on manure-mounds near farms. "Very common, breeds everywhere" (L.J. & D.). "Breeds" (Th.). "Nests in grassland, polders, and dried mud of shallow meres" (Davies & Pearson). "Breeds on all the Dutch Friesian islands" (L.J.).

AVOCET.

Fair numbers still on the Polder het Noorden at the end of August; twenty in a flock there on the 28th. Mr. Trapp showed us a nest, which he informed us had contained five eggs. Noted on 15, 16, and 17 September; a few only, after which none were seen, save a single bird on 4 October. "The main colony of Avocets breeds between Oosterend and De Cocksdorp, but there is a small colony at the south end near Oudeschild and also on Vlieland" (L.J.). "Breeds" (all authors).

RED-NECKED PHALAROPE.

One in the Polder het Noorden 28 August; Mr. Trapp informed us he had only met with this species once before. This bird had probably been driven in by the very strong south-west wind on the 25th–27th. Davies records seeing a Phalarope in spring in a pool at the south end of the island, but does not say of which species ('Field,' 23 October, 1909).

SNIPE.

Odd birds seen whenever we visited likely spots, such as swampy dykes in the polders; no migration noted. "A few seen, apparently not breeding" (V.). "Breeds fairly numerously" (D. & L.J.). "Not known to breed on the other islands" (L.J.).

JACK SNIPE.

First noted 25 September; but haunts were seldom visited. "One or two stragglers seen in the spring" (V.).

DUNLIN.

Enormous flocks on the sands by 25 August, and others seen on the edges of the pools in the polders. Some of them, at least, seemed to be mainly composed of adult birds which were still in breeding-plumage. Very numerous in September; additions to the numbers on the 19th, 24th, 28th, and 29th, after which the numbers decreased again daily. On the 25th flocks were seen arriving on the island, coming high up from the north-east. "Common; not known to breed on the island" (V.). "Single pairs breed at the north end" (L.J.). According to Mr. Vaughan, Schinz's Sandpiper, which is the small race of Dunlin, should be deleted from the avifauna of Texel, but Leege-Juist expressly says that this is the form which breeds there; and, of course, that is what one would expect, since the type-locality is the Island of Rugen in the South Baltic, and British breeding birds also belong to this race. I think, however, the vast majority of migratory Dunlins on Texel belong to the typical form *T. alpina alpina*.

If it were necessary to emphasize the fact that all is not known about even some of our commonest birds, I would cite this species as an example. The fact that we have in England long-billed and short-billed Dunlins (apart from sexual distinction, the female's bill being nearly always longer than the male's) has been known for a great number of years, and has been referred to over and over again; and even supposed differences in habitat have been recorded, one form being called the "shore Dunlin" and the other the "drain Dunlin." As Howard Saunders pointed out (and I have fully confirmed it*), it is the short-billed form which breeds in Great Britain. I have also recorded* the fact that, in my experience, migrants under stress of weather in winter to our shores invariably belong to the long-billed form, as do the vast majority of those which take up their winter quarters with us normally. What, I think, we do not know is whether the short-billed form *winters* with us at all; personally I have never seen a winter specimen of this form, and others have had the same experience; and I suspect that normally it winters to the south of our islands, a suspicion strengthened by the fact that on spring migration these short-billed birds reappear in full summer dress (often not recently acquired either), while the birds which have wintered here still retain, in a great measure, their winter plumage. It is a point, I think, worthy of attention.

LITTLE STINT.

One in the Polder het Noorden on 24 August and two on the sands on the 29th were the only examples noted.

CURLEW SANDPIPER.

Not uncommon on the sands in August; also seen on the muddy margins of the pools in the polders. A flock of forty on the sands on 1 September and several adults in breeding-plumage noted. Not met with on our second visit. I noted that they fed on a species of marine weed, I fancy *Zostera*. This species here, as with us, apparently does not tarry long on its autumnal migration.

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* Bull. B. O. C. vol. xxxiii. pp. 98–121.

KNOT.

Fair numbers on the shore in August; a few red adults noted. Very numerous in September, large increase on the 19th. Noted arriving over the island, high up, coming from the north-east on the 25th. By the first few days of October the numbers had largely diminished, but there were further arrivals on the 10th. The stomachs of all those I examined contained shoots of a marine plant, I think sea-samphire. "A few in breeding-plumage, no big flocks" (V.).

SANDERLING.

Two seen on the sandy shore to the west of the island on 20 September were the only specimens which came under observation. Possibly commoner than was apparent, but the tide's edge was not visited every day; indeed, it was sometimes not to be seen.

RUFF.

I think that by 24 August the majority had left; we saw several young birds in the Polder het Noorden on that date, but on the 28th only four, and an odd bird on the shore on the 31st. Not met with in September. "Breeds commonly in all the polders" (all authors). "Also breeds on the other Dutch islands" (L.J.). It is interesting to note that the early date of departure from the breeding-grounds roughly corresponds with the date on which this species may be looked for in England.

COMMON SANDPIPER.

A good many seen in the Polder het Noorden on 24 August, and odd ones on the edge of the shore, whither many came out from the polders to feed at dusk. Single bird on 8 September and six the next day were noted. "Seen in May; possibly breeds" (V.). "Erroneously recorded as a breeding species for the Dutch islands by Schlegel" (L.J.).

WOOD-SANDPIPER.

One or two seen in the dykes of the polders in August.

GREEN SANDPIPER.

As above, and odd birds, probably of this species, seen 25 September and 6 October.

REDSHANK.

Very common everywhere at the end of August in the polders, on the "puzzle-weed" and in the adjoining ditches and channels. Two pairs still had young unable to fly. Noted each day in September, with an increase on the 22nd, but the numbers by the early days of October had much diminished. "Breeds commonly" (all authors). "Breeds on all the Dutch Friesian group" (L.J.).

DUSKY REDSHANK.

Not common, but about half a dozen seen each day at the end of August, always singly. A very distinctive bird, its noticeably longer bill and legs at once attract attention; whilst its double-noted whistle, like that of the Ringed Plover, though louder and clearer, and the absence of the white wing-bar, further help to differentiate it from its commoner relative. One adult in black breeding-dress was seen on 31 August. In September and October odd birds were observed up to 10 October, but no marked migration was noted. Frequented the same sort of places on the shore as the Redshank, but seldom seen on the polders. "Small flock seen April 1914" (V.).

GREENSHANK.

In August it was fairly numerous, generally singly or in twos and threes, but I once saw twelve in a flock. They frequented the ditches of the "puzzle-weed," muddy pools, and sides of the channels, where they obtained small fry. Noted in September on most days, with an increase in numbers on the 18th, but by the end of the month and up to 10 October only odd birds remained. "A few birds seen in the spring" (V.).

BAR-TAILED GODWIT.

Mr. Vaughan remarks that "no better station can be found than this island for watching the migration of the

Bar-tailed Godwit" on its spring passage, and I can fully agree with this statement and confirm it as regards the autumn passage. During our stay, 25 August to 1 September, there were huge flocks massed on the shore; and, besides these, no day passed without our noticing huge flocks in W or V formation coming in high from the north-east and passing over to the south-west. The large flocks on the sand kept right out on the edge of the tide, not moving until the water became so deep that they had to fly. Quite a number were still in breeding-plumage. I only saw odd birds inside the sea-wall. The migration of this species is evidently a long drawn-out concern, as on our second visit (15 September to 10 October) Godwits were still very numerous, arrivals and departures being noted on many dates, and so the numbers fluctuated from day to day right up to 10 October. Vaughan saw great numbers on the shore on 5 May, 1913, and in the polders on 27 May, 1914.

The spring passage of this species along our eastern sea-board would appear not to reach as far north as Northumberland, as, whilst there is a marked passage on the Lincolnshire and Norfolk coasts, very few pass along the first-named county's shores at that season. On 25 August we secured two adult Godwits—one was still in the red summer-plumage with hardly a feather changed, the other had nearly finished its moult into the grey winter-plumage. Adult Godwits, like many other waders, doubtless leave their breeding-grounds in the north before commencing the moult, which takes place when they are congregated on such sand-flats as those of Texel. At first sight then it would seem curious that on the same day we should find two individuals in such diverse plumage, but I think the explanation probably is that the bird which had already assumed its winter-plumage had not been north to breed, and so had started to moult earlier. There are several very interesting points connected with the plumage of this species: it has long been known and has been a matter of comment that on spring passage we may see individuals in full red summer-plumage; while others in the same flock have *apparently* not cast a feather, and are still in the grey attire of winter. One explanation which has been put forward is that these grey birds are "out of condition," though what exactly is meant by that term I do not quite know, but it seems to me to be an explanation based simply upon the fact that they have not assumed summer-plumage! Then, again, why should quite a number of these birds be "out of condition" even though in company with others which are "in condition," with which they have travelled north and very probably wintered, and therefore been subjected to the same conditions? On the other hand, men that have handled such birds tell me that to all outward appearance they are in perfect condition, except that they are still in winter dress.

That these grey birds do not nest in that year is, I think, quite certain, as all those shot in the breeding-grounds, which I have examined, are in full summer-plumage; and it is not a little curious that the grey birds should migrate north at all, as far, at least, as the British and the Dutch coasts. Then, again, there are to be found individuals of some waders—Dunlin, Turnstone, Grey Plover, &c., which summer on our shores and do not breed, and yet have acquired as full a summer dress as those which have gone north to breed. If they, too, are "out of condition," why is it that they have attained breeding-dress?

These are very interesting problems, and might open up many wide discussions—such as reason and stimulus for a breeding-dress, influence of courtship, effect of possible internal secretions of the breeding-organs, &c., into which I cannot now enter, but they only tend to show how much we have yet to learn. Still there is one suggestion I should like to make as a possible explanation, and that is that the birds which have not gone into breeding-dress are those which have failed to find mates, and the birds which have acquired their breeding-dress but do not breed are those which have lost their mates. It may be said that such birds would surely find new mates; and, no doubt, this often happens with the Raven, Peregrine, Starling, and other species; but, even so, there is likely to be a residuum left, and it must be remembered that a male and a female are not necessarily a pair when it comes to mating, as has often been proved with ducks.

It has also been suggested that these grey summer birds are birds of a previous year, and that, as they are not going to breed, they retain their winter dress. That they are *not* I have no proof, but I have fully satisfied myself that quite a number of these birds of less than a year old attain as rich a summer dress at their first spring moult as obtains in any adult, for in such birds I have found odd feathers, usually tertials of the juvenile plumage, remaining. On the other hand, some at least of these grey summer birds may be, and probably are, sterile adult birds. These points are of considerable interest, and were fully commented on by Murray Adamson in the seventies and eighties, though they were to him a mystery, as they still are to us at the present day; and how can it be otherwise, seeing that for the last thirty-seven years it has been illegal to shoot a Godwit after 1 March till August or 1 September, during the very months when specimens, could they be obtained, would do much to clear up the mystery. Such protection is perfectly useless. In spite of rigid protection, the Bar-tailed Godwit (and in the same category I may mention, too, the Sanderling, Knot, Turnstone, &c.) has never bred in Great Britain and never will. It must be remembered that the number of these birds which halt for a few days on our shores during their vernal migration is but a small fraction of the total number of them in the world, and of this small fraction the few which would be shot could make no difference to the welfare of species, or lessen the numbers which would visit us another year; whilst it deprives of legitimate material for enquiry those who make a study of many of the unsolved problems in such birds, and so hinders progress. Indeed, judging by the earlier writings of the past century, more of such birds used to visit us prior to any protection at all than do so at the present time!

BLACK-TAILED GODWIT.

On 24 August we saw several in the Polder het Noorden, but the majority seemed to have gone; only two birds there on the 28th. I actually saw one feeding close to the road in company with some chickens! None seen in September. This species appears to keep inside the sea-wall, for we did not see it on the shore at any time. "Breeds commonly" (all authors). "Commoner at Waalenburg than in the north polders" (L.J.). Texel is the only island of the Friesian group on which this species breeds.

CURLEW.

Very numerous on the shore in August, numbers increasing almost daily, especially on the 30th and 31st. The adult birds were nearly through the moult into winter-plumage, whilst some of the Bar-tailed Godwits had not shed a feather. Numbers rested on the polders during the day and "flighted" out to the shore at dusk. During September and October this species was met with each day, though in far fewer numbers, there being notable decreases on 19 and 21 September, but there were fresh arrivals again on 10 October. "Noted as common in spring, and a few bred in the sand-hills" (V.). Also noted as breeding by all the other authors. "Single pairs breed on Vlieland and Terschelling" (L.J.).

WHIMBREL.

In August we saw a few each day, but usually in twos or threes, one small flock being observed; no marked migration. Single birds noted on 16 September and 1 October. "Noted as very common on spring migration" (V.).

BLACK TERN.

Not met with. "Colony of about forty pairs breed at Waalenburg" (L.J.); Daalder also gave me similar information, and this is doubtless the colony referred to by Thijsse and Popham (*in litt.*).

SANDWICH TERN.

Numbers seen in August and September up to 2 October and two birds on the 10th. Generally seen passing to and fro along the tide's edge, but they appear to fish more out at sea than the other Terns. Daalder informed me that in 1906 this species bred, after a lapse of fifty years, on the Polder het Noorden, where I examined the old nests on a promontory of dried mud covered with rough grass. "Breeds also on Rottum and one or two sand-banks in the Dutch Friesian group" (L.J.).

COMMON TERN.

Very numerous along the tide, in the channels and in the polders, where, at the end of August, some nestlings were still unable to fly. I found a young one in that state because of a disease of the growing quills of the flight-feathers, exactly similar to that in Wood-Pigeons. By 16 September all had apparently left, at which time Sandwich Terns were still quite numerous. "Breeds in numbers" (all authors) "as well as on the other Dutch islands" (L.J.).

ARCTIC TERN.

Athough particularly searched for during both visits to Texel, I could not satisfy myself that I saw this species. According to Leege-Juist, there were only three records of it on the Dutch coast up to 1896, in which year, however, Snouckaert van Schauburg established the fact that it was nesting on Texel among the Common Terns and that it constantly lays but two eggs. Both Daalder and Trapp assured me that it was common, and that its note was different from that of the Common Tern; however, a bird, whose note was different from that of the adult Common Tern, and which was pointed out to me as being an Arctic Tern, turned out to be a young Common Tern, on being shot. Mr. Charles Pearson assures me he saw both species at the breeding-place during his visit.

LITTLE TERN.

Common in August; fewer in September, all had gone by the 24th. This species fed in the dykes in the polders, and closely followed up the tide as it crept up the channels on the shore, the other Terns keeping further out in deeper water. Adult birds were in full moult at the end of August (body, wings, and tail), as were the adults of the other two species. Recorded as breeding (all authors); also "breeds on the other Dutch islands" (L.J.).

LITTLE GULL.

An immature and an adult seen on 25 September in the bay at De Cocksdorp.

BLACK-HEADED GULL.

Numerous during both visits and no migratory movements noted. Leege-Juist records four small colonies—the largest in reed-beds at Waterburg, the smallest at Nieuweschild on small reedy islets, one at the Mill at Oost on grass, and another at Oudeschild. It also breeds on Vlieland, but not on the other islands. "Breeds" (Th.).

COMMON GULL.

Very numerous in August on the polders and on the sandbanks, whither flocks from the interior of the island used to "flight" at dusk. The majority were birds of the year. In September this species was the commonest of the Gulls, and adults appeared to preponderate. According to Schlegel, there was formerly a small colony on Texel, but apparently it does not breed now on any of the Dutch islands, but does so on Sylt (L.J.). Recorded as breeding in Thijsse's list.

HERRING-GULL.

Abundant on the shore in August; in September fairly common, but scarce compared with the last species. "Breeds" (D. & Th.). "Single pairs breed in the dunes by De Cocksdorp: breeds on all the other Dutch islands in small numbers, except on Rottum where there is a large colony" (L.J.).

LESSER BLACK-BACKED GULL.

It is curious that, although particularly looked for, this species was not met with on either visit. I do not think we overlooked it. Daalder says it is seldom seen on the Texel coast. This is strange, as it is a common breeding species in the north, and being more migratory in its habits than any other of the gulls, one would expect to find it a regular autumn and spring migrant there, as is the case on the Suffolk coast.

GREAT BLACK-BACKED GULL.

Nowhere have I seen congregated together such numbers of adults of this species as on the sand-banks of the Vlakte van Kerken. There were several hundreds in one flock alone, and the sand-banks looked black and white with them. These banks are evidently favourite places for the adults to congregate during their moulting period. Immature birds were rather uncommon. After 21 September this species was not so much in evidence. Recorded as breeding by Thijsse, but by no one else of recent years.

RICHARDSON'S SKUA.

First noted on 24 September, after which odd birds were seen on several days, but they disappeared about the same time as the Sandwich Terns, their chief victims.

GUILLEMOT.

A single bird was noted on 2 October.

LITTLE GREBE.

A single bird was seen in one of the dykes on 28 September, but its haunts were not visited much. "Breeds on Texel, but on none of the other islands" (L.J.). "Occurs in the spring; breeding in 1913" (V.).

In addition to these records, the following species should be mentioned though not *positively* identified:—Corn-Bunting, one on 19 September; Little Ringed Plover, two on 21 September—a most likely species to occur; Gyr Falcon, a bird seen on 5 October, ascribed by Mr. Bonhote to this species. The Corn-Bunting has been recorded as breeding on Ameland, where, however, Leege-Juist did not meet with it. It is a scarce bird in North Holland. Two birds seen on 7 October were doubtfully ascribed by Mr. Bonhote to Richard's Pipit.

XI.—*A List of the Birds collected in Northern Saskatchewan and Northern Manitoba by Captain Buchanan in* 1914. By J. H. Fleming, C.M.Z.S., C.M.B.O.U.

Almost the first knowledge we have of the ornithology of the Saskatchewan region is that contained in a series of papers published in 'The Ibis' of 1861-62-63 by Captain Blakiston, who spent the winter of 1857–58 at Port Carlton on the Saskatchewan River, and in 1858 collected at various points in what is now the Province of Saskatchewan. In these papers he incorporated information contained in vol. ii. of the 'Fauna Boreali-Americana' of Richardson and Swainson, and other published sources of information. Since then our knowledge of the birds of southern Saskatchewan has been considerably enlarged, but strangely enough the ornithology of the great region drained by the Churchill River and lying to the north of what was till 1912 the northern boundary of the province has had little or no attention paid to it. Notes on the birds were made by James M. Macoun, who in 1888 travelled east from Lesser Slave Lake by way of the Athabasca and Churchill Rivers to Lake Winnipeg, and these were eventually published by John Macoun in his 'Catalogue of Canadian Birds.' Less than a dozen specimens are in the U.S. National Museum, collected at Du Brochet Lake in 1890 and Pelican Narrows on the Churchill River in 1891, probably by Henry MacKay and Joseph Hourston, for Roderick MacFarlane; these are the only skins I have seen from the region taken previous to 1914. During the years 1892–93–94, J. Burr Tyrrell in the course of his explorations of the Barren Grounds more than once traversed the Churchill River, and his official reports * contain the best description we have of this region; in these there are short references to birds. When Edward A. Preble wrote his great report on the natural history of the Athabasca-Mackenzie Region * he included all that was known of the ornithology of the Churchill River up to 1908.

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* Annual Report Geological Survey of Canada, viii. (new series), Part D, pp. 50–120 D, Ottawa, 1896; *ibid.* ix. 1896, Part F (1897).

When the boundaries of Saskatchewan were in 1912 extended north to include a part of the old North-West Territory, so little was known at Regina of the natural history of the northern part of the country that Angus Buchanan determined to investigate the district lying between the Saskatchewan River and the Barren Grounds. He left Prince Albert on 6 May, 1914, descended the Beaver River, reached Lake Île-à-la-Crosse on the 22nd, the Churchill River on 1 June, the Reindeer River on the 28th, Reindeer Lake on 9 July, arriving at Port Du Brochet in the newly extended Province of Manitoba on the 17th; he entered the Cochrane River on the 18th and Lake Du Brochet on 1 August; his base camp was made north of this lake, where he proposed to winter, but hearing of the outbreak of the war he decided to return to Regina, reaching that place on 15 January, 1915, after an absence of eight-and-a-half months, during which he travelled nearly 3000 miles by canoe and dog-sleigh. The specimens collected during this trip were divided, part being deposited in the Museum at Regina, and part being handed over to me; they form a very important addition to our knowledge of the birds of the region drained by the Churchill River, and constitute in fact the first collection made in northern Saskatchewan. After making a short report † of his trip to the Provincial Museum at Regina, Mr. Buchanan returned to his home in Scotland, enlisted in the Legion of Frontiersmen (25th Royal Fusiliers) as a private, was sent to East Africa and served throughout the campaign. He rose to the rank of Captain, received the Military Cross, and on being invalided home requested me to prepare a list of the

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* A Biological Investigation of the Athabasca-Mackenzie Region. North American Fauna, No. 27. Bureau of Biological Survey, Washington, 1908.

† Report of the Chief Game Guardian, 1914, pp. 33–34, 37–39; Regina, 1915.

birds collected in 1914. I had already examined those at Regina in 1915, and I am indebted to Mr. H. H. Mitchell of the Provincial Museum there for the loan of those that were needed for comparison. The data on the specimens themselves are exceedingly full, and Captain Buchanan has furnished me with a list of them, together with notes on the colours of the soft parts, food, etc.; from this I have quoted when necessary. The nomenclature used is that of the A. O. U. Check-List of 1910.

Colymbus holbœlli. Holbœll's Grebe.

Set of five eggs taken on Churchill River, 6 June; bird seen at close range.

Gavia immer. Loon, Great Northern Diver.

An adult taken on Reindeer Lake, 8 July.

Larus brachyrhynchus. Short-billed Gull.

An adult female taken on Reindeer Lake, 9 July, one more seen on same date; this is very far east for the Gull. "Iris clear blackish grey; edge of eyelid surrounding eye deep orange-chrome; corners of mouth pure orange-chrome; bill evenly coloured dead yellow; feet pale whitish yellow."

Dr. Oberholser regards this Gull as a subspecies of *Larus canus* *.

Larus delawarensis. Ring-billed Gull.

A male taken on Île-à-la-Crosse Lake, 23 May; adult, except for the black primaries and terminal black band of the tail; probably a non-breeding bird. "Bill medium dark greenish-yellow, with strong black ring around bill a short distance from tip; eyelids and corners of mouth deep orange-chrome; feet pale greenish-yellow." Seventeen others seen with this bird.

Larus philadelphia. Bonaparte's Gull.

Four specimens: an adult male (thought by the collector to be a non-breeding bird) taken on the Cochrane River,

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* 'Auk,' xxxvi. 1919, pp. 83–84.

20 July. "Iris dark; bill black; legs and feet orange-chrome." An adult female, taken on Cochrane River, 25 July. "Iris dark; eye-ring dark crimson; bill black; corners of mouth reddish flesh-colour; legs whitish orange-chrome; feet more rich chrome." Two juvenile birds taken on Lake Du Brochet, Cochrane River, 1 August; one of these, a female, is marked "Iris dark; bill medium dull blackish-grey; both mandibles dark from nostril out; legs, feet, and webs whitish skin-colour with pale brown joints." This species is believed to breed in trees here, and it is unfortunate, in view of the young birds taken, that the nesting-site was not found.

Xema sabini. Sabine's Gull.

Three seen and a pair of adults taken on Sandy Lake, Churchill River, 9 June; the female is marked "Iris black; pure red eye-ring; bill black to one-eighth beyond nostril, remainder of tip medium dull lemon-yellow; feet black."

Sterna hirundo. Common Tern.

A juvenile female, with pinions not fully grown, taken on Cochrane River, 14 August. Seen in company with parents and another young bird.

Mergus americanus. Merganser.

A male in very worn immature plumage taken on the Churchill River, 1 June. "Iris dark; bill medium deep crimson, crown of upper mandible black; feet bright orange-chrome."

Mergus serrator. Red-breasted Merganser.

An adult female taken on Lake Île-à-la-Crosse, 23 May. "Iris clear deep umber-brown; bill all red except along crown of upper mandible, which is dark horn-brown; legs and feet rich reddish orange-chrome."

A young female in down, length 14·75 in., taken on the Cochrane River, 15 August. "Iris pale clear brownish sage-green; bill blackish brown over crown of upper mandible for entire length except tip, sides of upper mandible and entire lower mandible pale dull buffish yellow: legs and feet dull brownish grey; neck dull umber-brown. Bird in company with mother and about a dozen young."

Set of twelve eggs taken on rocky island in Reindeer Lake, 12 July. "Nest found on ground concealed beneath ledge of rock, eggs almost on rock, and rim of nest composed of small leaves and twigs profusely mixed with blackish-grey down."

Nettion carolinense. Green-winged Teal.

A pair taken on the Beaver River, 18 May.

Oidemia perspicillata. Surf Scoter.

Three specimens: one adult male taken at Lake Île-à-la-Crosse, 31 May; two adult females taken on the Reindeer River, 30 June. "Flock of about twelve Scoters together, all in pairs."

Phalaropus fulicarius. Red Phalarope.

A male taken on Sand-Fly Lake, Churchill River, 11 June.

Steganopus tricolor. Wilson's Phalarope.

Two specimens: an adult female taken on Crooked Lake, 13 May. "Bird alone, resting as if tired out, perhaps migrating." The other an adult male taken on the Beaver River, 19 May. "Male and female together on floating weeds on edge of small lake off Beaver River; birds in company with a pair of Dowitchers and a Lesser Yellow-leg."

Gallinago delicata. Wilson's Snipe.

Nest taken near Lake Île-à-la-Crosse, 31 May. "Four eggs, slightly incubated, nest of damp grasses among low snowberry bushes. Flushed bird off nest three or four times to-day and yesterday."

Macrorhamphus griseus griseus. Dowitcher.

Five specimens: a pair taken on Crooked Lake, 13 May, have been compared with a series of this form and of *M. g. scolopaceus.* Another pair taken on the Beaver River 19 May, and a male on Lake Île-à-la-Crosse on 23 May.

Pisobia fuscicollis. White-rumped Sandpiper.

A female taken on Sandy Lake, Churchill River, 10 June, and a male taken, Sand-Fly Lake, Churchill River, 11 June.

Pisobia bairdi. Baird's Sandpiper.

Four specimens: a female taken near Fort Du Brochet, Reindeer Lake, on 17 July, and a male and two females taken on the Cochrane River, 23 July.

Pisobia minutilla. Least Sandpiper.

Four specimens: a female, Reindeer Lake, 13 July. "Bird alone on island, apparently had nest." A female taken 29 July, and a pair taken 30 July on the Cochrane River.

Pelidna alpina sakhalina. Red-backed Sandpiper.

A female, Churchill River, 8 June. "Shot on small stony island, in company with seven Semipalmated Sandpipers."

Ereunetes pusillus. Semipalmated Sandpiper.

Two pairs obtained on the Churchill River, 2 June, from a flock.

Calidris leucophæa. Sanderling.

Three specimens procured from a flock of four, Cochrane River, 21 July, "probably non-breeding birds."

Helodromus solitarius solitarius. Solitary Sandpiper.

"A female with large egg in oviduct," Beaver River, 18 May.

Actitis macularia. Spotted Sandpiper.

Two adults: a male, Crooked River, 15 May, and a female, Lake Île-à-la-Crosse, 23 May. Two sets of four eggs each, taken on the Churchill River, 10 and 13 June, also a downy young bird taken on the Cochrane River, 29 July.

Charadrius dominicus dominicus. American Golden Plover.

An adult female, taken when in company with Kildeer Plover on the Churchill River, 2 June. "Eye, bill, and feet black."

Oxyechus vociferus. Kildeer.

Seen in company with the Golden Plover, but no specimens taken.

Ægialitis semipalmata. Semipalmated Plover.

Four specimens: a male, Île-à-la-Crosse, 23 May; a pair, Cochrane River, 23 July, and a female taken 29 July, also on the Cochrane River.

Arenaria interpres morinella. Ruddy Turnstone.

Four specimens: a female found alone on Lake Île-à-la-Crosse on 22 May; a male also found alone on the same lake on the 23rd; and two females obtained from a large flock on 9 June on the Churchill River.

Canachites canadensis canadensis. Hudsonian Spruce Partridge.

Eight specimens, six adults and two downy young. A pair with nest and eggs taken at Lake Île-à-la-Crosse, 25 May; male not preserved. "Eggs six in number, fresh; nest on ground close at foot of alder bush; site dry open poplar knoll, surrounded by dense spruce and tamarack swamp; nest of dry leaves, same as carpet of surrounding ground, a few feathers lining nest." A male, same locality, 29 May. A female in moult and a downy young, Reindeer Lake, 10 July; the female has pin-feathers on the sides of the head, and new tail-feathers are appearing. A downy young bird, Cochrane River, 20 July, was with other young and female parent when taken. A male taken, 3 August, a female, 4 August, and a male, 7 August; all adults, Lake Du Brochet. The young could fly, though the first-named was only five inches in length.

Lagopus lagopus lagopus. Willow Ptarmigan.

One specimen, Fort Du Brochet, Reindeer Lake, 4 November. "Same day first Barren Land Caribou of the season were shot."

Accipiter velox. Sharp-skinned Hawk.

An adult male, Otter Lake, Churchill River, 20 June.

Astur atricapillus atricapillus. American Goshawk.

A female and set of three eggs, Beaver River, 16 May.

Buteo platypterus. Broad-winged Hawk.

Three specimens: a melanotic male, Crooked River, 14 May, is chocolate-brown except for the tail-bars, which were normal; a male was taken in the same locality on the 15th, and a female taken on Beaver River, 16 May.

Haliaëtus leucocephalus alascanus. Northern Bald Eagle.

An adult and three downy young, the first a male taken on the Churchill River, 12 June; the downy young taken on Reindeer Lake, two on the 7th and one on the 10th of July; these are marked "Iris dark umber-brown; bill dark horn-colour, cere slightly lighter brown; corner of mouth pale whitish-yellow; legs and feet pale whitish-yellow."

Falco columbarius columbarius. Pigeon Hawk.

Seven specimens. An adult female (two other birds seen), Reindeer Lake, 13 July. A female in company with four or five almost fully-fledged young, three of which were taken, Lake Du Brochet, 3 August; the young have the wings and tail not fully grown, and traces of down on the head; the old bird is in very worn plumage with one fresh blue tail-feather, but showing no other sign of the blue plumage. Two fully-fledged young birds; two others seen, Lake Du Brochet, 7 August.

Pandion haliaëtus carolinensis. American Osprey.

Three specimens. A female, Crooked Lake, 13 May. A male taken with nest, Lake Île-à-la-Crosse, 25 May: "Nest containing single egg on very top of broken-off dead Jack pine; nest mainly built of dry twigs, inside thickly lined with damp mud, grass and moss; fish-scales on edge of nest: the male bird was bringing both talons full of damp moss to nest when shot." A female taken with nest and two eggs, Churchill River, 6 June.

Surnia ulula caparoch. American Hawk Owl.

A male taken on Lake Du Brochet, 1 August.

Picoides arcticus. Arctic Three-toed Woodpecker.

An adult male, Cochrane River, 31 July; yellow crest much worn, exposing the white bases of the feathers.

Picoides americanus fasciatus. Alaskan Three-toed Woodpecker.

An adult female, Fort Du Brochet, 22 October.

Sphyrapicus varius varius. Yellow-bellied Sapsucker.

Two males, Big River, 7 and 11 May.

Colaptes auratus borealis. Boreal Flicker.

One female, Cochrane River, 31 July, the male seen. There is another adult female in the U.S. National Museum taken at Lake Du Brochet 26 September, 1890. This form is included in the range of *luteus* in the A. O. U. Check-List.

Sayornis phœbe. Phœbe.

A male, Reindeer River, 30 June.

Nuttallornis borealis. Olive-sided Flycatcher.

Two males, Lake Île-à-la-Crosse, 27 and 28 May.

Empidonax trailli alnorum. Alder Flycatcher.

Three specimens: a male, Churchill River, 6 June; two from the Cochrane River, 27 and 28 July, the latter a female; all taken in willows at edge of marsh.

Empidonax minimus. Least Flycatcher.

A female, Lake Île-à-la-Crosse, 29 May, and a male, Reindeer River, 28 June.

Perisoreus canadensis canadensis. Canada Jay.

An immature bird, Reindeer Lake, 11 July, is somewhat difficult to place; it compares well with one of about the same age from 40 miles S.W. of Calgary, Alberta, 4 August, 1895, and is not so dark above as a younger specimen from Latchford, Ontario, 10 June, 1906. Preble refers to a breeding bird from Pelican Narrows, Churchill River, in the

U.S. National Museum [*], and in fact Reindeer Lake is well within the known range of *canadensis.*

Corvus corax principalis. Northern Raven.

Five specimens: three from Churchill River, a young bird taken from the nest, 2 June, an adult female, 18 June, and a young bird fledged and in company with parent and two other young; two adult males taken 15 December, one on Lake Du Brochet, the other on Reindeer Lake.

Corvus brachyrhynchos brachyrhynchos. American Crow.

An immature female taken on the Reindeer River, 29 June; this bird compares with a breeding female from Craven, Saskatchewan, much better than it does with Ontario birds, and may perhaps be placed with the Western Crow, *C. b. hesperis*; but owing to lack of material of comparable age I hesitate to do so.

Euphagus carolinus. Rusty Blackbird.

Three specimens from Lake Du Brochet, 7 August: an adult male, "iris clear yellowish white"; an immature (female ?), "iris medium clear umber-brown"; and an immature male, "iris pale sage-green."

Carpodacus purpureus purpureus. Purple Finch.

Two adult males, Big River, 9 May; a female seen with them.

Acanthis linaria linaria. Redpoll.

Three specimens: an adult male with rosy breast, Cochrane River, 21 July, "bird in company with one young, bill dark brownish"; two males, an adult and young bird, Lake Du Brochet, 10 August, "bill flat black" in the young.

Plectrophenax nivalis nivalis. Snow Bunting.

One specimen, Reindeer Lake, 23 October. "Large flocks of these birds for the past fortnight."

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[*] North American Fauna, No. 27, 1908, p. 402.

Passerculus sandwichensis alaudinus. Western Savannah Sparrow.

Three specimens: one from Lake Île-à-la-Crosse, 27 May, an adult male from Fort Du Brochet, 17 July, and a juvenile female, Cochrane River, 28 July. These are very dark birds, much more so than *alaudinus* should be, and very different from the light race that breeds in southern Saskatchewan, which is no doubt *nevadensis*.

Passerherbulus lecontei. Leconte's Sparrow.

Two specimens: one of a pair, Churchill River, 2 June; a male, Haultain River, 6 June: "birds breeding here."

Zonotrichia querula. Harris's Sparrow.

Seven specimens: an adult female and a juvenile male, Cochrane River, 26 July; an adult male, Cochrane River, 30 July, "male and female with fledged young"; a female and young bird, Cochrane River, 31 July; a female, Cochrane River, 3 August, "bird in company with others, probably her fully-fledged young"; an adult female, Lake Du Brochet, 6 August. Adults' "bill dull sienna-brown"; juveniles' "bill blackish brown, yellow along edges of mandibles and at corners of mouth." So little is known of the early plumage of this Sparrow that a description of the young of 31 July may not be out of place: Length 3·75 in.; pileum with feathers brownish black indistinctly edged with greyish buff, producing a dark crown with a few greyish-buff spots; throat and chin greyish buff, throat with a few blackish-brown spots; chest brownish buff streaked with brownish black; flanks buff with brown streaks; rest of under parts buffy white. Above brown streaked with black; upper tail-coverts brownish buff, tail darker than in adult; wing-coverts tipped with buff.

Zonotrichia leucophrys gambeli. Gambel's Sparrow.

Three specimens: an adult male and a juvenile male, Reindeer Lake, 16 July; and a young male, Cochrane River, 26 July.

Spizella monticola monticola. Tree-Sparrow.

A male, Reindeer Lake, 11 July, "two pairs breeding on an island; first of this species seen on this expedition." A female, Fort Du Brochet, 17 July, "bird had young almost fully fledged."

Spizella passerina passerina. Chipping Sparrow.

A male, Lake Île-à-la-Crosse, 27 May.

Melospiza melodia melodia. Song-Sparrow.

A pair, Reindeer River, 28 June.

Melospiza lincolni lincolni. Lincoln's Sparrow.

A male, Reindeer River, 29 June.

Melospiza georgiana. Swamp-Sparrow.

A male, Churchill River, 6 June. "Small colony of the birds breeding in this place."

Passerella iliaca iliaca. Fox Sparrow.

Four specimens, all males: one Reindeer Lake, 11 July; three Cochrane River, 18 and 24 July and 3 August; the July bird was carrying food to its fledged young.

Petrochelidon lunifrons lunifrons. Cliff-Swallow.

Two females, Churchill River, 9 June; a pair, Cochrane River, 6 August; fully fledged young in company with these last.

Iridoprocne bicolor. Tree-Swallow.

Two specimens: a female, Crooked River, 15 May; a young male, Du Brochet Lake, 6 August. Two sets of eggs taken on the Churchill River, 11 June; nests in old woodpeckers' holes in dead poplars.

Riparia riparia. Bank-Swallow.

A male, Sandy Lake, Churchill River, 9 June.

Bombycilla garrula. Bohemian Waxwing.

Two specimens from Cochrane River: a juvenile male taken 28 July—"iris dark, not reddish brown like adult"; an adult female, 30 July.

Bombycilla cedrorum. Cedar Waxwing.

A male, Key Lake, 25 June.

Lanius borealis. Northern Shrike.

A male, Cochrane River, 19 October.

Vireosylva olivacea. Red-eyed Vireo.

A male, Dead Lake, Churchill River, 17 June.

Lanivireo solitarius solitarius. Blue-headed Vireo.

A male, Lake Île-à-la-Crosse, 28 May.

Mniotilta varia. Black-and-White Warbler.

A male, Beaver River, 17 May.

Vermivora peregrina. Tennessee Warbler.

Three males, two from Lake Île-à-la-Crosse, 27 May and 2 June, one from Dead Lake, Churchill River, 17 June.

Dendroica æstiva æstiva. Yellow Warbler.

Two males, one from Lake Île-à-la-Crosse, 27 May, the other from Reindeer Lake, 4 July; the latter is only a little more worn than the May bird.

Dendroica coronata. Myrtle Warbler.

Three specimens: two adult males from Big River, 7 and 8 May; a juvenile, Cochrane River, 27 July. Hoover's Warbler, *D. c. hooveri,* has recently been received by Dr. Oberholser, and the range of this western race of the Myrtle Warbler is given as reaching east to central Mackenzie; but the adult taken 8 May, which I have been able to compare with series of both the supposed races, is nearer to *coronata.*

Dendroica striata. Black-poll Warbler.

A male, Beaver River, 18 May.

Dendroica palmarum palmarum. Palm Warbler.

A male, Beaver River, 18 May.

Seiurus noveboracensis noveboracensis. Water-Thrush.

Three specimens: a female, Beaver River, 20 May, a male, Knee Lake, Churchill River, 6 June, and a female, Reindeer River, 28 June; these are close to Grinnell's Water-Thrush, *S. n. notablis,* in colour.

Wilsonia pusilla pusilla. Wilson's Warbler.

A male, Lake Île-à-la-Crosse, 26 May.

Sitta canadensis. Red-breasted Nuthatch.

A male, Lake Île-à-la-Crosse, 25 May.

Penthestes hudsonicus hudsonicus. Hudsonian Chickadee.

Three specimens: a pair taken at Big River, 8 May, and a young bird, Cochrane River, 24 July; the last is interesting, for, though full-grown (length 5 in.), the pileum instead of being soft greyish brown is blackish brown, forming a distinct cap, while the hind neck and back are brownish grey.

Regulus calendula calendula. Ruby-crowned Kinglet.

Three specimens: a male, Lake Île-à-la-Crosse, 28 May, a female taken with nest containing young, Churchill River, 3 July, and a male taken at Reindeer Lake, 9 July. The nest here mentioned is described as follows:—"Nest in young spruce tree about ten feet high; placed against limb and about eight feet up. It contained seven young about fourteen days old."

Hylocichla aliciæ aliciæ. Grey-cheeked Thrush.

Two males: Big River, 11 May; Churchill River, 18 June; the latter is in very worn plumage, "bird in company with mate."

Hylocichla ustulata swainsoni. Olive-backed Thrush.

Two males: Île-à-la-Crosse, 25 May, and Black Bear Island, Churchill River, 14 June.

Hylocichla guttata pallasi. Hermit Thrush.

A male, Beaver River, 18 May.

XII.—*Notes on South African Accipitres.*

By Lieut. C. G. Finch-Davies, 1st S.A.M.R.

In submitting the following notes on the South African Birds of Prey, I do so knowing that they are far from being perfect; but at the same time I hope that something of interest will be found in them, and that they will lead ornithologists who may have better opportunities than I have, to inquire into and elucidate some of the questions that I have raised. I am aware that there have been numerous changes made in the nomenclature of the group; and as I have not had access to all the literature in this connexion, I have thought it best to adhere, for the most part, to the old names, and the arrangement followed by the late Mr. J. H. Gurney in his 'List of the Diurnal Birds of Prey.'

The Accipitres appear to have been somewhat neglected in recent years by modern ornithologists, and there is no doubt that this Order is in need of critical examination and rearrangement, while many genera will have to be split up at least into subgenera. I have, however, not attempted anything of that sort in this place, partly because I do not feel myself competent to do so, not having sufficient material at my command, and partly because Mr. A. Roberts of the Transvaal Museum, in a letter to me, has informed me that he has in hand a review of the South African species, and judging from a brief summary which he has sent me, it would appear that he proposes to make a good many changes in nomenclature, both as regards species and genera.

The notes on habits and plumage-changes are all from my own personal experience; and if they appear somewhat meagre, I must ask to be forgiven, for the reason that during twenty-five years' soldiering in South Africa, most of the time in the ranks, I have been unable to keep copious notes, and even those that I have made from time to time have for the most part been lost. During the last few years I have been devoting special attention to this group, always a favourite with me, and have been also finishing a series of paintings of all the South African species in different stages of plumage. With reference to the plumage-changes, I would like to point out that many authors mention and describe many "stages" through which certain species pass before attaining the fully adult state, and give us the impression that each individual passes through these "stages." This I do not believe to be the case. That many species take several years to assume the fully adult plumage is well known, but in my opinion this change does not always follow any particular rule, some individuals attaining the adult plumage quicker than others. We cannot place too much reliance on observations made from captive specimens, which, of necessity, live without proper exercise, food, etc., under abnormal conditions, such as tend to delay, or arrest, the normal process of moulting. Thus Mr. A. K. Haagner, the director of the Zoological Gardens at Pretoria, informed me that a Bateleur Eagle (*Helotarsus ecaudatus*) in the gardens took eight years to assume the fully adult plumage. I greatly doubt whether under normal conditions it would have taken so long to do so.

I have not here gone into the geographical distribution of the various species, as this subject requires more time than I have yet been able to devote to it. In this connexion I would remark that the fact of a certain species having been recorded from this or that locality does not necessarily mean that such locality is its true "*patria*," as in many cases single individuals straggle to districts far from their real home; these will generally be found to be young birds (such as the single specimen of *Gypohierax angolensis* secured by Ayres at Potchefstroom), and for the following reason. I believe that in most species of Birds of Prey each adult pair have their chosen home and beat over the surrounding country, which they jealously guard against all intruders; and as each brood of young are fledged and able to fend for themselves, they are driven off by their parents and become wanderers until such time as they can secure a location for themselves and mates to share it with them.

Although during the many years I have lived in South Africa I have travelled through most parts of it, I have only been able to do any systematic collecting in eastern Pondoland, East Griqualand, and recently in the country lately known as German South-West Africa but now as the South-West Protectorate. Therefore my notes refer principally to these districts.

In the following notes I shall have occasion to refer to the following works :—

(1) Catalogue of Birds in the British Museum. Vol. I. by R. Bowdler Sharpe.
(2) The late J. H. Gurney's "Notes" on the above Catalogue, which were published in 'The Ibis' between 1875 and 1882.
(3) 'A List of the Diurnal Birds of Prey' by the late J. H. Gurney.
(4) 'The Fauna of South Africa': Birds. Vol. III. by Mr. W. L. Sclater.

The first I will refer to briefly as "Sharpe," the second as Gurney's "Notes," the third as Gurney's "List," and the fourth as "Sclater."

In conclusion I would like to thank the Directors of the Transvaal, South African, Port Elizabeth, Albany, Natal, Durban, and Rhodesian Museums for their great kindness in answering my numerous queries, and in many cases sending me specimens for examination. Also Mr. W. L. Sclater and Mr. J. H. Gurney for kindly giving me certain information with regard to specimens in the British and Norwich Museums.

1. **Serpentarius secretarius** (Scop.). Secretary Bird.

I have never found this bird very numerous, but have seen it practically in every part of South Africa I have visited; it is, perhaps, scarcest in the South-West Protectorate, where I have only met with it on one or two occasions. Adults are usually seen in pairs, single birds as a rule being immature or young. They look very handsome stalking along over the veldt. The long tail and crest, together with the black thighs, which contrast strongly with the slate-grey plumage, combine to give them a peculiarly fine appearance. Although I have never found them particularly wild, they generally keep well out of gunshot, and if approached too closely, at first run with outstretched wings at a good pace, and then, if still pursued, rise and fly off. I have heard it stated that they can be caught with dogs, or by pursuing them on horseback. I should think this must be very unusual, as I have never seen them have any difficulty in rising and flying off as far as they wished, and have often seen them soaring at a great height—once while partridge-shooting high up on the Drakensberg Mountains, I saw one high overhead. Certainly, when there is little or no wind, they seem to have a little difficulty in rising quickly, requiring to run for some distance before they launch themselves into the air.

There has been much discussion from time to time as to whether this bird should be protected by law. Formerly it was protected owing to its supposed snake-killing propensities; but this protection has now been withdrawn, owing to the fact that it has been found harmful to game. Personally I am of the opinion that this fine species should be granted the fullest protection, for the reason that it is nowhere common enough to do any real harm to the stock of game. Certainly it does destroy game-birds, chiefly the young and eggs. I had only to watch a pair beating over the veldt to understand that little that moves can escape them, and I have taken from the crop of one specimen three young quails, half a dozen larks' or pipits' eggs, a rat, a lizard, and a small night-adder. On the other hand, it destroys a very large number of rats, mice, locusts, etc. Near a tree in which was a nest of this species, I found hundreds of "castings"; these were the size and shape of an ordinary sausage, and on examination proved to consist almost entirely of the bones and fur of rats and mice, with occasionally the remains of lizards and snakes. Amongst those I examined there were no signs of feathers. As to its supposed snake-killing habits, I am firmly of the opinion that it never goes out of its way to look for snakes; but it would certainly attack and kill any it came across, as it would almost any other living thing—from beetles, termites, and grasshoppers, to mammals as large as a young hare. I have only found one nest; this was situated in the main fork of a small black wattle-tree growing in a paddock on a farm in East Griqualand. It was a huge mass of sticks and grass, and contained one young bird nearly fledged; the remains of another lay on the ground under the nest. It is a curious fact that, in this and some of the other large Birds of Prey, although the full complement of eggs is two, and two young are usually hatched, rarely more than one reaches maturity—either the other dies in infancy, or else it is pushed out of the nest by its parents or its fellow.

I have nothing to add to the description of plumages given by Sclater, except to note that the iris in the young bird is usually very dark brown, and the bill dark brown or black, not whitish grey as in the adult. The white upper tail-coverts are also usually more or less barred with black.

2. **Lophogyps occipitalis** (Burch.). White-headed Vulture.

I have only met with this Vulture in the northern portions of the South-West Protectorate and Ovamboland, but in the latter country it was the only species of Vulture I noticed. I usually saw it in pairs, but after a fight with the natives in Ovamboland, when there were numerous dead horses lying about, a good number collected to feed on the carcasses, together with Kites and Pied Crows.

As regards plumages, I should think that Sclater's description of the juvenile plumage was taken from a bird in change to maturity. Quite young specimens which I have seen were very dark brown everywhere, including the downy feathers on the head. There is at present an immature specimen living in the Pretoria Zoological Gardens, which has almost assumed the adult plumage. This bird still retains a good many of the brown feathers of the juvenile plumage among the white feathers of the head.

3. **Otogyps auricularis** (Daud.). Black Vulture.

As with the previous species, the only part of South Africa in which I have observed this bird is in the South-West Protectorate. There, on the whole, I found it rather scarce; but one day, while out shooting in the Windhuk district, I came across quite fifty of these huge Vultures feeding on a dead horse in company with a few Kolbe's Vultures (*Gyps kolbei*). I was rather surprised to see so many together, as in all accounts I have read of its habits this is said to be rather a solitary bird, not more than a pair being usually seen feeding at a carcass at which other species form the majority. They were not particularly wild, and I shot a fine specimen. It may be worth while here to note the colouring of the bare parts of the head and neck in this specimen, as they differ in some respects from the description given by Sclater. The general colour of the upper part of the head and neck pale flesh, brightening here and there, especially about the neck lappets, to pale crimson, below the eyes and base of lower mandible changing through lilac to leaden blue.

4. **Gyps kolbei** (Daud.). Kolbe's Vulture.

This is the common Vulture of the greater part of South Africa, and I have met with it almost everywhere I have been. I believe it has not been previously recorded from the South-West Protectorate, but, as I have mentioned above, I met with a few feeding on a dead horse, together with the previous species, in the Windhuk district.

This is such a well-known bird and so much has already been written about its habits, that I have little to record in this respect, except to note that of recent years it has been the cause of great loss to farmers in some districts, from its habit of attacking and killing lambing-ewes and lambs. So much has this been the case, that in many places poison clubs have been formed to deal with the Vultures. I would also like to mention an instance of the extraordinary vitality shown by one of these birds, which I killed while it was feeding on a dead horse. I shot it with a service Lee-Metford rifle, the bullet entering the head on the left side in the region of the ear and coming out below the eye on the opposite side, but apparently missing the brain. The bird was picked up as dead and carried to camp—a distance of about three hundred yards, showing no signs of life except for convulsive movements now and again. Yet after lying on the ground for a few minutes, it suddenly jumped up, ran a few yards, and then launched itself into the air and flew out of sight over some hills, never to be seen again. I have no notes as regards plumage-changes.

5. **Gyps rueppelli** (Bon.). Rüppell's Vulture.

I am of the opinion that this Vulture will have to be removed from the South African list. It is a North African species, which I believe has never occurred in South Africa, all records of its presence having been errors caused by confusing it with *Pseudogyps africanus*, which in its juvenile plumage somewhat resembles it. Therefore, I believe that on investigation it will be found that all Vultures procured in South Africa and hitherto identified as belonging to this species will prove to be *P. africanus*.

Many years ago Mr. J. H. Gurney (Senior) recorded Vultures of this species as having been collected by the late Thomas Ayres at Potchefstroom and in Natal; and in this connexion I wrote to Mr. J. H. Gurney (Junior) asking him to examine the specimens, if they were still in the Norwich Museum. He replied, informing me that there were only two South African specimens in the Museum labelled *G. rueppelli*—one collected by Ayres at Potchefstroom, the other by Verreaux with locality "S. Africa."

From the descriptions furnished me by Mr. Gurney, I believe both of these should be referred to *P. africanus.* Furthermore, all the Vultures found breeding at Potchefstroom and collected by Major Sparrow and Mr. Austin Roberts have proved to be *P. africanus.*

Mr. W. L. Sclater, writing of a collection of birds procured by himself on the Zambezi at the Victoria Falls (Ibis, 1905), records a specimen of *G. rueppelli.* This specimen is now in the South African Museum at Cape Town, and through the kindness of the Director I have been able to examine it; there is no doubt whatever that it is a specimen of *P. africanus* in juvenile plumage. The number of tail-feathers is not always a safe guide, as I shall have occasion to point out when discussing *P. africanus.* There are no specimens of the true *G. rueppelli* in any of the South African museums.

6. **Pseudogyps africanus** (Salv.). African White-backed Vulture.

I have never met with this species in any part of South Africa in which I have been stationed, and so am not able to add anything to what has already been written with regard to its habits. I would, however, like to discuss a point which seems to me to require investigation. The genus *Gyps* has been separated from *Pseudogyps* on account of the number of tail-feathers, which are fourteen in the former, and are said to be twelve in the latter; but as regards the present species, this does not appear to be a constant character. I have not been able to examine a large series, but there is a very typical adult mounted in the South African Museum, Cape Town, procured by Mr. Austin Roberts at Potchefstroom, which has fourteen tail-feathers (counted). The descriptions of the adult and young plumages given by Sclater do not seem to me to be particularly good. I should not consider the colour of the adult "dark brown," but pale silvery brown, almost pale grey; on the other hand, the young plumage is dark brown, each feather with a central fulvous streak and paler edging, the neck-ruff being composed of lanceolate feathers bordered with dark brown. There is no sign of the white back of the adult.

7. **Neophron percnopterus** (Linn.). Egyptian Vulture.

I have met with this Vulture sparingly in the south-eastern districts of South Africa, but never came across it in the South-West Protectorate, whence it was recorded by Andersson. I have occasionally seen it beating about native kraals on the look-out for offal, but I should think that it met with little success, as the native dogs and pigs leave little in this line. Sometimes when a horse or other animal has died on the veldt, I have seen one or two of these birds feeding at the carcass together with Kolbe's Vultures. I have never met with it nesting, nor have I ever seen young or immature specimens, and there are none in any of the South African Museums. In recent years I have heard of no cases of it nesting anywhere in South Africa, so that I am of the opinion that it must now be a much rarer species than it used to be when, as recorded by Sclater, it was found breeding at Hopefield and Colesberg.

8. **Neophron pileatus** (Burch.). Hooded Vulture.

I have never met with this species, and although it was recorded by Andersson from Damaraland, I never saw it in that country. I have no notes as to plumage-changes, etc.

9. **Gypaëtus ossifragus** (Savig.). Southern Lammergeyer.

In my experience this must be a very rare species all over those districts in which I have collected, as I have never met with it. In East Griqualand I was stationed for many years close to the Drakensberg mountain-range on the border of Basutoland, where I should have expected it to occur; but I never heard of it, unless the "Golden Eagles" which from time to time people told me they had seen belonged to this species.

10. **Gypohierax angolensis** (Gmel.). Vulturine Sea-Eagle.

The single juvenile specimen of this bird, which was secured by Ayres at Potchefstroom in the Transvaal, was no doubt an accidental straggler to South Africa, and no further specimens appear to have been secured.

The systematic position of this species appears very doubtful. I have here followed Gurney in placing it next to *Gypaëtus*, but Sclater places it between *Helotarsus* and *Haliaëtus*.

11. **Circaëtus fasciolatus** (Gray). Banded Harrier-Eagle.

I have not met with this species, which appears to be a rare bird everywhere in South Africa. To the localities from which it has already been recorded I can add Portuguese East Africa, whence there are two specimens, an adult female and an immature male, in the Transvaal Museum, Pretoria. The adult female does not differ from Sclater's description, with the exception of having white or whitish tips to many of the feathers of the scapulars and lesser wing-coverts, and of having the tail brownish grey, crossed with four black bands.

I have not seen a description of the young of this species, so will here give a short description of the immature specimen in the Transvaal Museum. The plumage, especially on the head and neck, is a good deal worn, and there and on the breast and flanks a few feathers of the adult plumage are appearing. The upper surface of the head and the back of the neck are white, each feather with a fulvous brown centre and a darker brown shaft-streak, while here and there new dark brown feathers are appearing. Sides of face, ear-coverts, chin, and throat white streaked with pale greyish brown. Mantle, scapulars, wings, and upper tail-coverts similar to the adult but everywhere paler brown. The tips of all the feathers whitish and with dark brown shaft-streaks. Tail pale brown, crossed by fine dark brown bands. Breast and whole of the under parts white; on the breast most of the feathers have dark brown shaft-streaks and terminal spade-shaped spots, while a few of the barred feathers of the adult plumage are appearing on the flanks.

12. **Circaëtus pectoralis** (Smith). Black-breasted Harrier-Eagle.

I have met with this species on but few occasions. In eastern Pondoland I only once saw a specimen; in East Griqualand I shot an immature bird; and in the South-West Protectorate I saw only one or two examples during my stay. For this reason I cannot say much from personal observation with regard to the habits. Those I have seen have usually been perched on the top of some large thorn-tree, or else soaring, often at a good height. The crop of the only specimen I ever shot contained the remains of a lizard and a rat. In his notes on Sharpe's Catalogue Gurney very fully discusses the various phases of plumage this species passes through in changing from the juvenile to the adult state, and from my observations it would appear that the conclusions arrived at by him are correct. I would, however, like particularly to point out what may be considered as the second stage of plumage, in which this species closely resembles the European *C. gallicus*. This has apparently caused Mr. Austin Roberts, of the Transvaal Museum, to record a specimen of the latter species from South Africa. I have examined the specimen, and in my opinion it is merely an example of *C. pectoralis* in immature plumage. Mr. Gurney has, moreover, drawn attention to a fact which has also struck me, and that is the extraordinary extent to which the plumage of all the Harrier-Eagles is liable to abrasion before a new moult sets in. I have an immature specimen in which the upper surface of the head is white with narrow dark brown shaft-streaks. This is caused by the *entire* webs of all the feathers having been worn away, leaving only exposed the dark brown shafts and the white downy bases of the feathers.

13. **Circaëtus cinereus** (Vieill.). Brown Harrier-Eagle.

I have met with this Harrier-Eagle both in eastern Pondoland and in the South-West Protectorate. In the former country I believe it to be migratory, as I have only seen it there during the summer months, though in fair numbers. I have usually found it singly, occasionally in pairs, and generally among the mimosa-bush country along the river valleys. These birds seem to be rather sluggish and to spend a considerable time seated on the top of some conspicuous tree, but I have occasionally seen them soaring at a good height, and when doing so they have always appeared to me to resemble large Kites, while the shape of the wings and the fact that the outer tail-feathers are slightly longer than the others add to this resemblance. I believe their food to consist almost entirely of snakes, lizards, mice, and rats, but I once saw an individual make a very determined stoop at a partridge which I put up.

There has been a good deal of discussion from time to time as to whether or no this bird and *C. pectoralis* are one and the same species, but I think it is now agreed that they are distinct. (See Mr. W. L. Sclater's Notes, Ibis, 1912, and Mr. Claude Grant, Ibis, 1914.) Gurney also discussed the question very fully in 'The Ibis,' 1878, but at that time did not appear to have come to any definite conclusion, while subsequently in his "List" he kept the two birds separate.

Sclater, in his 'Fauna of South Africa': Birds, vol. iii., united the two species; so for the benefit of those who have not seen accounts of adult and juvenile plumages, I will give brief descriptions here. The adult is of an uniform dark sepia-brown both above and below, all the feathers strongly glossed with purplish red in some lights; the tail grey barred with dark brown. The young are very similar in general colour, although perhaps of a rather paler brown, and with more or less exposed white bases to the feathers of the under parts.

14. **Helotarsus ecaudatus** (Daud.). Bateleur Eagle.

I found this fine Eagle fairly numerous in eastern Pondoland as well as in the South-West Protectorate, and have had pretty good opportunities of observing its habits. It is a bird of magnificent flight, spending nearly all its time on the wing; in fact, I scarcely ever remember having seen one perched. There are few more beautiful sights than to watch one of these birds—the flight is very easy and buoyant and peculiarly characteristic, so that even when seen at a great distance the identity of the species is never in doubt. The jet-black plumage of the head and body contrast beautifully with the snow-white under surface of the wings, while the red cere, legs, and feet, the last extended beyond the short maroon-red tail, add just the right finishing touch.

I have noticed that each pair seem to have a recognised beat, and, at any rate in the breeding season, chase away all intruders on what they consider their own hunting-grounds. I once saw a pair in full pursuit of a third which had evidently been caught poaching. They were going at a tremendous pace, and one of the pursuers was making a curious hollow drumming sound, caused as far as I could judge by the wings being struck together over the back, much as some pigeons are in the habit of doing. On another occasion I saw a Tawny Eagle drive away one of these birds which had approached too close to its nest, but the Tawny Eagle was no match for the Bateleur in flight. In his beautiful work, 'A Breath from the Veldt,' Mr. J. G. Millais figures and describes a habit, noticed by him in this species, of looking downwards and backwards when hunting, so as to search the ground over which it has already passed. I must have seen hundreds of these birds, but have never noticed this habit, although they often look straight downwards, as other eagles do. I hope Mr. Millais will forgive me for criticizing his drawing of the bird in flight, but he depicts it with its feet drawn up to its breast, whereas, in my experience, this and all other Birds of Prey fly with the legs and feet extended below the tail. Moreover I have never seen this species attack game-birds as described and figured by the same author, and I think such an occurrence must be very rare, as although it is a bird of strong flight, the bill and feet are comparatively weak, and not adapted to attacking and killing any large prey. In my experience that prey consists principally of such small game as snakes, lizards, rats, and mice—in fact nothing larger or stronger than a young hare ; added to which it will also feed on carrion, and at one of my camps quite a number were caught in traps baited with raw meat and set for jackals. I have only found one nest. This was placed in a fork of one of the large branches of an enormous "Camel-thorn" tree, and was quite inaccessible. The smaller branches of the same tree were crowded with thorny nests of the Buffalo Weaver (*Textor niger*). In Pondoland the natives have some superstitions with regard to the Bateleur, and at one time witch-doctors would be willing to give as much as a cow for the body of one of these birds, from which a powerful "medicine" was made, with which the fighting men were doctored in war-time.

The progress from the juvenile to the adult plumage appears to be very gradual, but there seems to be no distinct intermediate stage, as immature birds may be found showing every stage of progress. I have already mentioned a specimen in the Zoological Gardens at Pretoria which was said to have taken eight years to attain the adult plumage. It has been suggested that the difference in colour of the secondary wing-feathers in adults is sexual, the male having these uniform black, while in the female they are grey with a terminal black band. From my own experience I am inclined to believe this to be the case, but I have not been able to examine a sufficient number of correctly-sexed specimens to decide the question. With regard to the white-backed form which was named *H. leuconotus* by Rüppell, much discussion has taken place from time to time as to whether it should be considered as merely a variety, a very old bird, or a distinct species. Personally I am inclined to the belief that it may be considered as a geographical race, for I understand that the great majority of specimens of this form have been obtained in the White Nile region. In South Africa it must be very rare, and none of the South African museums possesses a specimen. The only South African record I can find is a note by Mr. G. A. K. Marshall (Ibis, 1900, p. 258), where he records having seen three examples near Salisbury, Mashonaland. The only specimen at all approaching the white-backed form I have met with personally was an adult male which I shot at Okanjande in the South-West Protectorate; in this all the rufous portions of the back were much paler than usual, though the feathers were not worn or faded. Other specimens shot in the same district were normal. As to the systematic position of the species, I agree with Gurney that it seems best to place it near the Harrier-Eagles.

15. **Polyboroides typicus** (Smith). Bare-cheeked Hawk.

This handsome Hawk is not uncommon in eastern Pondoland, where I have chiefly had opportunities of observing its habits. I have also met with a few individuals in East Griqualand and in the South-West Protectorate. I have almost invariably found them singly and usually amongst the bush bordering rivers and streams. From the contents of the stomachs of those that I have examined it would appear that their food consists almost entirely of frogs, lizards, and insects of all sorts. I have observed one going through curious gymnastic feats amongst the branches of a decayed tree, sometimes clinging to the bark like a creeper, at others hanging more or less upside-down beneath a branch like a Tit. I believe that the bird was busy extracting the large grubs with which the decayed portions of the tree were riddled. I have usually found this species among rather thick bush, but I once saw it stalking about on the open veldt, apparently hunting grasshoppers, and looking very much like a small Secretary Bird in gait and other ways. I have only found one nest; this was in eastern Pondoland, and was situated in the fork of a tree in a wooded kloof, but

I was unable to reach it. The nest appeared to be a comparatively small structure of sticks, and judging by the behaviour of the parent birds, which were very fearless, probably contained eggs or young. The flight is rather slow and "floppy," though I have seen them soaring, but not as a rule at any great height.

In juvenile plumage this species seems to be very variable, and there appear to be two extreme forms of colouring in that plumage. In one the colouring is very dark both above and below; the sides of face, ear-coverts, and throat very dark brown, almost black. The other is a very pale form on a typical specimen of which in the Transvaal Museum collection I have made the following notes:—"A juvenile specimen from Knysna; very pale above, the buffish tips to the feathers predominating over the dark brown basal portions. On the head and neck the feathers are tawny rufous with dark brown centres; the throat and breast tawny white with narrow dark brown streaks, the flanks, abdomen, and thighs tawny buff, mottled with tawny brown."

Among the adults I have examined I have noticed that some have almost lost the black spots from the scapulars and wing-coverts; perhaps these are very old birds. There is a rather curious specimen in the Transvaal Museum from Klein Letaba in which the *whole* plumage of the upper parts is very finely vermiculated with a paler shade of grey. The white tail-bars are also much more finely vermiculated than usual, and the *whole* of the plumage of the under parts is so much suffused with grey that they might be described as being grey, here and there slightly barred with white and a darker shade of grey. There is another specimen in the same collection from Swaziland which is similar, but the grey shade is not quite so pronounced.

16. **Circus macrurus** (Gmel.). Pale Harrier.

I have found this Harrier fairly numerous during the summer months throughout the open country in the eastern districts of Cape Colony, but much less common in the South-West Protectorate, with the exception of the vicinity of the great Etosha Pan on the borders of Ovamboland, where I saw a good many in January, 1917. So much has already been written of the habits and plumages of this and other European Harriers that I shall add nothing here.

17. **Circus cineraceus** (Mont.). Montagu's Harrier.

This species, although met with in the same districts as the preceding, never appears to be nearly so common; but the females and young of the two being so nearly alike when seen on the wing, it is difficult to lay down any definite ruling in this respect, and I can only base my conclusions on observations of adult males, and even the latter are not easily distinguished when seen at a distance. In the South-West Protectorate I never met with it except in the vicinity of the Etosha Pan, where I shot an adult and young male in January, 1917. Although this species is usually found in South Africa only during the northern winter, I shot an adult male in East Griqualand on the 8th of July, 1911, which is mid-winter in South Africa. I have never met with the melanistic form in South Africa, nor do I know of any such specimens having been secured.

18. **Circus maurus** (Temm.). Black Harrier.

I have never met with this Harrier, which appears to be confined to the southern districts of Cape Colony. I almost think that the bird is on the verge of extinction. There appear to be no very recent examples in any of the South African museums. Although I have made diligent enquiries, I have been unable to hear of any young specimens, or to obtain one, or even to hear of this species in localities where it is supposed to occur. I would therefore be very much obliged if anyone knowing where it does still occur would give me any information, and if possible send young and immature specimens.

19. **Circus æruginosus** (Linn.). European Marsh-Harrier.

This seems to be a very rare species in South Africa, and the few specimens that have been secured all appear to have been young or immature. I have never personally met with it.

20. **Circus ranivorus** (Daud.). African Marsh-Harrier.

I found this Harrier very common throughout the south-eastern districts of Cape Colony wherever marshy ground was to be found, but never met with it in the South-West Protectorate or Ovamboland. I had fully expected to see it in the latter country, as, at the time I was there, from January to March, 1917, the country was more or less a marsh. It is entirely a marsh frequenter, and closely resembles the European species in habits. It is usually seen beating slowly over the reed-beds in search of prey, which consists of almost any living thing which it is strong enough to kill—such as frogs, small birds, mice, rats, young ducks, and snipe. I have several times found places where it had been feeding on Dabchicks (*Podiceps capensis*), though how it had managed to catch these agile divers is a mystery. If the sportsman returns to a marsh on the day after he has shot over it, he will find all along the shores the remains of ducks that had been lost at the time but subsequently found and eaten by the Marsh-Harriers. At sunset, when the Bishop-birds and other Weavers return in thousands to the reed-beds to roost, I have noticed the Harriers dashing about and chasing them, to their great confusion, but I have never seen any caught. When duck-shooting I have often found the nests of this species, usually placed near fairly shallow water, and built in the middle of a clump of rushes ; but on one or two occasions I have seen them in fairly deep water supported on a mass of floating vegetation. I once found a nest containing two eggs within a few yards of two nests of the South African Bittern (*Botaurus capensis*), one of which contained young, the other three eggs. During the breeding-season I have noticed the male birds soaring up to a great height, and then descending in a series of dives with closed wings, after each dive shooting up a little way and at the same time uttering a kind of mewing cry—evidently a kind of "love flight."

I have nothing to note as regards the juvenile plumage, but it seems to me that there is a distinct difference between the sexes when adult. Females usually have a white or buffy-white band across the breast, and the feathers of the nape and lesser wing-coverts much more marked with white than the males; old males also have the central tail-feathers strongly shaded with grey. There is a very handsome specimen of what I take to be a very old male bird in the Transvaal Museum, which has not only all the tail-feathers grey, barred with very dark brown, but all the primaries, primary-coverts, bastard wing, and secondaries of the same colour.

21. **Melierax canorus** (Risl.). Chanting Goshawk.

I have not met with this exceedingly handsome species in the eastern Cape Colony, but in the South-West Protectorate it was fairly common, especially in the thorn-bush country, which covers most of the central and northern districts. It is usually seen in pairs or singly, perched on the top of some conspicuous thorn-tree on the look-out for its prey, which consists, so far as I have observed, principally of small mammals, lizards, and small birds; but on several occasions when I have been out shooting guinea-fowl and partridges, a few individuals have appeared, evidently on the look-out for wounded birds or dead ones that had been lost. Its musical call has often been noted, but its singing powers as described by Levaillant are evidently a fiction.

In juvenile plumage this species seems to be subject to a certain amount of variation, but I have not been able to handle a sufficient number of specimens to discuss the question thoroughly.

22. **Melierax mechowi** (Cab.). Mechow's Goshawk.

My experience of this species is very small. I have only met with one or two specimens in the northern parts of the

South-West Protectorate and in Ovamboland. From what I saw of it, it appeared to resemble the previous species in habits, except that I generally found it in rather denser bush country. The crop of a specimen I shot contained a mouse.

22. **Micronisus gabar** (Daud.). Gabar Goshawk.

23. **Micronisus niger** (Bonn. et Vieill.). Black Gabar Goshawk.

I have not the slightest doubt that the black Gabar is only a melanistic form of the grey Gabar, as has already been suggested by other authors; both are equally common in the South-West Protectorate, the only part of South Africa where I have met with the species, and there I have frequently observed pairs, one of which was black and the other grey. I was, however, never lucky enough to find a nest belonging to one of these mixed pairs; it would have been interesting to see what the young birds were like, but I believe that the young of the black form are black from the time that they are hatched, so that one never meets with birds changing from the normal juvenile plumage to the black plumage. I have shot a black female with one of the secondaries with a broad white tip as in the normal form. Another which I took to be a young bird had two normally coloured barred feathers on the flanks. I have also noticed that the intensity of the black coloration varies in different specimens. Some are intensely black, so that even the barring on the tail and larger wing-feathers is more or less obscured, while others are a more *greyish* black. There is a very interesting specimen in the Albany Museum. This is a grey bird, but of a much darker grey than usual; the dark bars on the breast and flanks are broader and darker, and there are dark grey, almost black, bars on the normally white upper tail-coverts. It appears to me that this example was a variation in the direction of the black form. Some specimens of the black form have the tarsi and feet yellow, others red. I believe the yellow-legged birds to be juveniles. I have noticed that among the black birds, females appear to be far more numerous than males.

I have nothing much to record about the life-history of this species, which has all the habits of a typical Sparrow-hawk, frequenting the bush country and taking its prey, which consists principally of small birds, by a quick dash.

By Gurney, Sharpe, Sclater, and most other authors it has been placed in the genus *Melierax*, but I think it should be removed from this and kept in Gray's genus *Micronisus*, of which it is the type. In proportions and habits it is very different from *Melierax*.

24. **Asturinula monogrammica** (Temm.). One-streaked Hawk.

I know nothing of the habits of this species from personal observation, as I have never met with it. Sharpe does not give any description of the juvenile plumage, and Sclater's account is decidedly meagre. I have examined a very large series from all parts of South Africa, and have never yet met with a specimen answering to Sclater's description of the young plumage, so that I might conclude that either there are no juvenile specimens in any of the South African museums, or else that there is some error in Sclater's description. There are, however, two examples among the large series in the Transvaal Museum which I take to be either young or immature. These resemble adults in every way, except that all the feathers of the scapulars and wing-coverts have narrow whitish edges, and the tail-bar, instead of being white, is dark grey.

With regard to the systematic position of this species, I have here followed Gurney in placing it near *Melierax*, to which it seems to me to have some affinity. Sharpe, and following him, Sclater have placed it among the *Aquilinæ*, but I am very doubtful whether it has any real relationship to that group.

25. **Scelospizias polyzonoides** (Smith). Little Banded Goshawk.

I have only met with this little Hawk in the thorn-bush country of the South-West Protectorate, where it is not uncommon. In habits it appears closely to resemble the English Sparrow-hawk, living amongst thick cover and preying on small birds; but I have occasionally found the remains of locusts in its crop. I have sometimes seen it perched on a small bush situated in the middle of some open ground, and I believe on the look-out for small rodents. I have nothing to record with regard to plumage-changes, but I would note that all the adults I have shot have had the irides bright red.

26. **Scelospizias tachiro** (Daud.). South African Goshawk.

This is a common Hawk in all the forest country in eastern Pondoland, and I have occasionally met with it in the adjoining districts of East Griqualand. It is a powerful and highly predatory species, and a great enemy of all small birds and mammals. It does not, however, confine itself entirely to birds and mammals, as I have taken the remains of lizards and frogs from the crop. It is truly wonderful to watch the ease and speed with which one of these hawks will dash through the thickest bush and whip some unsuspecting bird from its perch before it has time to know what has happened. They are also very destructive to poultry, where any are kept at places near their haunts. In the breeding season the males have a curious habit of soaring in circles high over the bush and at the same time uttering a curious squeaky cry—a habit I have never noticed in any other of the short-winged hawks. I have noticed that there is a distinct sexual difference in the plumages of the adults of this species. In the females the colour of the upper parts is brownish grey, and the under parts are somewhat dingy in colour compared to those parts in the males, with coarser bars; whereas in males the upper surface is a clear slate-grey, and the under parts are more brightly coloured with the bars narrower and more even. In the males also the tail always has two clearly marked white spots on the central tail-feathers.

27. **Accipiter minullus** (Daud.). Little Sparrow-hawk.

I have seen very little of this tiny Sparrow-hawk and have only met with it in eastern Pondoland, but even there on very few occasions. It is, however, such a small bird, living in very thick cover, that it may easily be overlooked. It is, from all accounts, a decidedly fierce little creature, preying on birds even larger than itself. One I shot was feeding on a thrush. Although I have never seen it noted, there appears to be a distinct difference in plumage between males and females. The males have the bars on the under surface broader and closer together, and sides of breast and flanks much more suffused with rufous, those parts in the female being almost white, narrowly barred with brownish black.

28. **Accipiter minullus tropicalis** (Rchw.).

I have not met with this race myself, but there are specimens in the Transvaal Museum, labelled *T. m. intermedius,* which I would refer to it; and my friend Major Thompson, of the S.A.M.C., showed me a specimen which he had shot at Grootfontein in the South-West Protectorate, which I would also refer to it. I was rather surprised to see that Mr. Claude Grant, when writing of *A. minullus* in 'The Ibis' some years ago, considered that Reichenow's *A. tropicalis* was not a good subspecies. Judging by those I have been able to examine, it appeared to me that there was a very distinct difference between the almost black colouring of the upper parts of the southern race and the grey colour of those parts in the northern race. In the latter also the under parts seemed paler, with less bright rufous colouring on the flanks.

29. **Accipiter ovampensis** (Gurney). Ovamboland Sparrow-hawk.

I have not met with this species and have nothing to record with regard to habits or plumage. I would note, however, that the type locality should be written Ovam*b*oland, not Ovam*p*oland.

30. **Accipiter melanoleucus** (Smith). Black-and-white Sparrow-hawk.

This appears to be everywhere a rare species, and I have never personally met with it. It, however, occurs in eastern Pondoland, as a specimen shot there was sent to me by a friend; this specimen was in the black, white-breasted plumage, and when shot was after my friend's chickens. Apart from the juvenile plumage, there appear to be two adult plumages—one in which the greater part of the under surface, like the upper surface, is black, and the other in which there is a good deal of white on the under surface. Most authors regard the latter as an immature stage, but this requires confirmation. An immature female in the King William's Town Museum appears to be changing into the later plumage, a good many black feathers, more or less barred with white, appearing amongst the rufous feathers of the under parts. I have never seen an entirely black specimen, the darkest I have seen having the throat white, the under tail-coverts barred with white, and more or less concealed white bases to the feathers of the abdomen.

This species should, in my opinion, be placed in a separate subgenus. It is a very large bird for a Sparrow-hawk, almost equalling the European Goshawk (*Astur palumbarius*) in size, and strongly resembling the young of that species when in juvenile plumage. The black and white plumage of the adult is strikingly different from that of any other member of the genus *Accipiter*.

31. **Spizaëtus coronatus** (Linn.). Crowned Hawk-Eagle.

I have only met with this splendid Hawk-Eagle in the forest country of eastern Pondoland, where it does not appear to be very common, or, at least, is not often seen. It is not, as a rule, observed on the wing, but I have occasionally seen it soaring at some height, uttering a loud cry. When seen in flight it is quite unmistakable owing to the broad, short wings and long tail. Its prey normally consists of monkeys, smaller bush-antelopes, bush-francolins, etc.; but where its haunts are in the vicinity of houses or native kraals, it will often take fowls and other domestic birds. I once saw it hovering, like a gigantic Kestrel, over some terrified fowls that were taking cover in some long grass and low bushes, and I have heard of several undoubted cases of its having attacked and sometimes killed young pigs. Anyone who has examined a specimen in the flesh, cannot fail to have been struck by the immense muscular strength of the legs and feet, armed as the latter are with huge talons. In an adult female the hind claw measures as much as three inches round the curve, and for its size I think this species must be one of the most powerful Eagles in the world.

There is a very fine series of specimens of this Eagle in the Transvaal Museum, in all stages of plumage; and from an examination of these and others, I have come to the conclusion that there is a distinct sequence of plumages between the juvenile and adult dress, of which I will give a brief summary.

In the first plumage the whole head, neck, and under surface are white, with a faint tinge of rufous on the bases of the breast-feathers, and a few brown streaks on the longer feathers of the thighs. The upper surface is pale greyish brown, barred with dark brown, and all the feathers are broadly edged with white. The next stage is very similar, but the longer feathers of the crest have longitudinal marks of dark brown along the shafts. The breast is more strongly suffused with rufous, and the flank-feathers have dark brown shaft-streaks. The feathers of the tarsi have a good many dark brown spots appearing amongst the white. In the third stage all the feathers of the head and neck have dark brown centres, and the whole upper surface has become much darker owing to the dark brown markings predominating over the light. The feathers are, however, still broadly tipped and edged with white. The whole of the under parts are now rufous with paler edges to the feathers. There are one or two dark brown spots on the feathers on the sides of the breast, and the tarsi have completely assumed the spotted feathers of maturity. In the fourth stage, which might be called semi-adult, the upper surface is still darker, almost as dark as in the adult, but still barred with paler colour and edged with white. The under surface is rufous, marked with brownish black, but the dark markings, instead of forming broad bars as in the adult, are more in the form of rounded spots—one on each web, so that the predominating colour is still rufous, not black barred with rufous-white as in the adult. The fifth stage is the adult plumage more or less complete, but signs of immaturity are usually to be observed in narrow pale edges to many of the feathers of the upper surface. In very old birds the black markings of the lower throat and breast predominate to such an extent that these parts almost appear black, the rufous-white bases of the feathers only showing here and there.

32. **Lophoaëtus occipitalis** (Daud.). Crested Hawk-Eagle.

I have met with this handsome Eagle only in eastern Pondoland, where it is not uncommon and is generally conspicuous, as it has a habit of sitting on the tops of dead trees, especially those which are often left standing by the natives in the middle of their corn lands. No doubt it finds these perches convenient posts from which it can keep a look out for the rats, mice, lizards, etc., which form its principal prey. It is a somewhat sluggish bird, spending a great deal of its time on the above-mentioned perches, and is seldom seen on the wing, although I have occasionally seen it soaring, but at no great height. Unless the bird is perched, the long crest is generally held at an angle of about 45 degrees, the tips of the long feathers moving gently in the breeze, but in flight the crest is laid flat on the neck.

As regards plumage-changes, there appears to be very little difference between the juvenile and adult. The young bird is usually described as being similar to the adult, but to differ in having the tarsi streaked with dark brown. Now, from the investigations I have made, I have come to the conclusion that some error has been made here, as I have examined several specimens which are evidently young or immature, in my opinion, all of which have pure white tarsi. On the other hand, I have examined several others which I consider are fully adult, and which have streaked tarsal feathers. The only certain sign that I have found which indicates immaturity is that in all examples of what I consider to be young birds, the white bases of the outer webs of the primaries are more or less barred and freckled with brown, whereas in adults these feathers are uniform white at the base. I am also of the opinion that the youngest birds are palest in colour, and that as they grow older the plumage becomes darker. There are two specimens of this species in the Transvaal Museum, one from Rhodesia and the other from German East Africa, which are remarkably dark in colouring, almost black in fact, with the back of the neck, which is usually of a lighter colour, as dark as the rest of the plumage; they also have the tarsi streaked with dark brown. These I take to be fully adult and probably very old birds. I have a painting of a similar specimen, shot by myself in eastern Pondoland some years ago.

33. **Nisaëtus bellicosus** (Daud.). Martial Hawk-Eagle.

My experience of this Eagle is very small. It appeared to be a rare species in every district where I have collected. I saw the skin of an immature bird in eastern Pondoland, which was shot in the act of attacking a young pig ; and in the South-West Protectorate a few specimens, one of which made a very determined stoop at a Francolin I had put up. However, it did not succeed, as the bird dropped like a stone into some long grass. This species must be fairly numerous in the King William's Town district, as I saw a number of specimens in the Museum at that place which had been collected there. These were principally young birds.

I have not had an opportunity of examining a sufficient number of individuals to enable me to discuss the plumage-changes, but from what I have seen I should think that the change from juvenile to adult plumage was somewhat gradual, as in *Spizaëtus coronatus*. Thus I have seen immature specimens in which the feathers of the upper surface, although otherwise dark brown as in the adult, had broad pale edges; the feathers of the upper breast the same.

It seems to me that it will be necessary to form a new subgenus for this species, as it does not appear to be congeneric with the members of the genus *Nisaëtus*. By Sharpe and some other authors it was placed in the genus *Spizaëtus*; but although it resembles *S. coronatus* in the shape of the bill, in the possession of a crest, and in the juvenile and adult plumages, the proportions of the wing and tail are quite different.

34. **Nisaëtus spilogaster** (Bon.). African Hawk-Eagle.

I have only met with this species in the South-West Protectorate, and it was by no means common in those parts in which I have collected, so that I have had little opportunity of observing its habits. From what I have observed it is an entirely game-killing Eagle, with habits very similar to its near relative in Europe, *N. fasciatus*. One which I shot had been feeding on a guinea-fowl, another had the greater part of the hind leg of a hare in its crop, and I saw another pursuing some tame pigeons.

I have not much to note with regard to plumage-changes, but would draw attention to the fact that it appears to moult directly from the juvenile to the adult plumage; while signs of immaturity are observable for some time in a rufous edging to many of the feathers of the sides of the head, neck, and ear-coverts, and also in rufous tips to the feathers of the under parts, especially on the thighs,—in fact, I have rarely met with a specimen which has not had some sign of the rufous shading on the thighs. I have recently seen a very fine adult male living in the Zoological Gardens at Johannesburg which has struck me as being remarkable, in that the dark streaks on the breast and flanks are much broader than usual, covering the greater part of the feathers; the thighs are also strongly streaked with black.

35. **Hieraëtus ayresi** (Gurney). Ayres's Hawk-Eagle.
Lophotriorchis lucani (Sharpe).

I have nothing to add to what I have already written in a recent number of 'The Ibis' on the subject of this Eagle.

36. **Hieraëtus pennatus** (Gmel.). Booted Eagle.

The Booted Eagle appears to be rather a scarce species in South Africa. I shot a single adult female in eastern Pondoland, an immature female in East Griqualand, and have seen one or two in the South-West Protectorate. So much has already been recorded of its habits in Europe that I have nothing to add here, except to note that my Pondoland specimen had the remains of a small chicken in its crop. The East Griqualand specimen was also pursuing some fowls when I shot it.

Plumage-changes, and the question of the dark- and light-breasted forms have already been very fully discussed by Dresser in his 'Birds of Europe,' and by M. Bureau in an article in the Journal of the Assoc. Française pour l'Avancement des Sciences, vol. iv.

37. **Aquila verreauxi** (Less.). Black Eagle.

I have met with this fine Eagle among the Drakensberg Mountains on the border of East Griqualand, and recently in the mountainous parts of the South-West Protectorate, near Windhuk. It is everywhere rather a scarce bird, and I fear that unless laws are made, and enforced, for its protection it will soon become extinct in many parts, as it is accused by farmers of killing lambs, which it undoubtedly does occasionally; but I believe that the harm it does in this way is very small, as its favourite prey is undoubtedly the rock-rabbit (*Procavia*), to which may be added the young of the smaller antelopes—especially the Klipspringer, hares, and also game-birds of various sorts (I once found a guinea-fowl in a nest of this Eagle). It is a very powerful bird, and no doubt quite capable of killing and carrying off a small lamb or a kid, and a young bird which was kept in captivity by a German farmer in the Windhuk district one day seized two goat kids, one in each foot, and would no doubt have killed both if help had not arrived in time. The flight is very fine, and there are few more beautiful sights than to watch a pair of these birds when they are soaring and playing together in the air, the snow-white rump and edging to the mantle showing up most beautifully against the jet-black of the rest of the plumage. I was fortunate enough to find a nest in the Windhuk district: it was situated on a ledge in the face of a sheer, but not very high cliff, and contained two eggs: one white, an almost perfect oval, very slightly broader at one end, measuring 79·9 × 60·9 mm. The other was similar in shape, but a good deal spotted and blotched with red-brown (dry blood-colour), chiefly at the *smaller* end; measurements 77 × 59 mm. The nest was a large mass of sticks with a shallow depression in the centre and lined with a thick pad of narrow green leaves of a shrub growing plentifully on the hills round about. This was on 5 May, 1919. The male bird was on the nest when I found it, and was not particularly wild, often approaching quite close while I remained in the vicinity; but the female, although she circled about within sight, would not come near me. Formerly this Eagle was thought to have a remarkably disconnected range, having only been recorded from Abyssinia and South Africa; however, it has since been recorded from East Africa and Rhodesia, and now from South-west Africa, and I believe that it will eventually be found to occur right through Africa wherever suitable mountainous country is to be found.

As regards plumage-changes, I have not been able to examine a sufficient number of specimens to be able to give a definite opinion, but it would seem that there are no intermediate stages between the juvenile and adult plumages. Signs of immaturity are to be seen in some specimens in otherwise adult plumage, in a slight rufous edging to some of the feathers on the sides of the head, and some brown tipping and freckling on the otherwise white feathers on the rump and sides of the mantle.

[To be continued.]

XIII.—*A Review*[*] *of the African* Dicruridæ *in the British Museum*[†]. By David A. Bannerman, M.B.E., B.A., M.B.O.U., F.R.G.S.

Whilst naming the Drongos in the Christy collection from the Belgian Congo in the summer of 1919 I took the opportunity to work through the whole group of African Dicruridæ.

Very little work seems to have been done on this group since Shelley's last volume (v., 1912) of the 'Birds of Africa,' edited by Mr. W. L. Sclater, and Reichenow's 'Vögel Afrikas' were published.

Oberholser worked through the *adsimilis* group in the Proc. U.S. Nat. Mus. xxviii. 1905, pp. 918–920, and his conclusions seem to be quite sound. As I disagree in some important points with the conclusions arrived at by Shelley and Reichenow, I here publish the results of my own investigations.

In all, I recognise 8 species and subspecies from the mainland of Africa, Fernando Po, and Zanzibar as follows:—

1. *Dicrurus modestus modestus.*	Prince's Island.
2. *Dicrurus modestus coracinus.*	African mainland.
3. *Dicrurus adsimilis adsimilis.*	African mainland.
4. *Dicrurus adsimilis divaricatus.*	African mainland and Zanzibar.
5. *Dicrurus adsimilis atactus.*	African mainland.
6. *Dicrurus atripennis.*	African mainland.
7. *Dicrurus sharpei.*	African mainland.
8. *Dicrurus ludwigi.*	African mainland.

I have found it impossible to make anything like a really serviceable Key to this group, as where we have to depend for distinguishing characters largely on the amount and shade of the "gloss" on the plumage, and on the relative degree of "fork" in the tail, a concise Key to the species and subspecies is generally not very satisfactory. Instead I have mentioned the most striking characters, given the original description, type locality, and range as shown by the magnificent series in the British Museum, and stated the number of skins in the National collection which I have examined and rearranged.

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[*] The Review here published was written in July 1919. Owing to lack of space in 'The Ibis' it has been held over by the Editor. If, in consequence, the conclusions arrived at are "out of date," the author hopes that the unavoidable delay in publishing will be taken into consideration. Owing to absence abroad he has been unable to revise the paper here submitted.

[†] Published by permission of the Trustees of the British Museum.

In giving the range, only skins which I have examined personally have been utilized, unless otherwise mentioned.

AFRICAN DICRURIDÆ.

1. Dicrurus modestus modestus.

Dicrurus modestus Hartl. Rev. et Mag. Zool. 1849, p. 495—Type locality: Prince's Island.

Chief characters. Back velvety-black; crown of head glossed with green. Size large. Wings 131–139 mm., average 134 mm. Quill-lining dark; tail markedly forked; bill very heavy.

Range. Confined to Prince's Island.

Number of skins in the British Museum: 12.

2. Dicrurus modestus coracinus.

Dicrurus coracinus Verr. Rev. et Mag. Zool. 1851, p. 311—Type locality: Gaboon.

Chief characters. Similar to *D. m. modestus*, but smaller. Wings 121–133 mm., average 128 mm. A single bird from the Upper Congo has an exceptional wing-measurement of 136 mm. (the birds on the coast are relatively smaller than those inland). Tail slightly shorter; bill shorter and less heavy.

Range. Gaboon, Cameroon, Fernando Po, Nigeria, Uganda, Upper Congo, North Angola.

Number of skins in the British Museum: 25.

Dicrurus adsimilis and subspecies.

In this division I include:—

D. adsimilis adsimilis.
D. adsimilis divaricatus.
D. adsimilis atactus.

I was at first greatly nonplussed by finding *D. adsimilis divaricatus* and *D. adsimilis atactus* both ranging to the

Gold Coast—a fact which induced me to believe without careful examination of material that the two forms must be synonymous. An examination of the birds, five *D. a. divaricatus* from the Gold Coast and thirty-five *D. a. atactus* from the type locality, did not strengthen that view. The latter birds could be distinguished by their more velvety-blue appearance and by the very dark lining to the quills (a character which does not seem to vary in *D. a. atactus* but which in *D. a. divaricatus* certainly does vary, new quills being darker and wearing lighter).

A closer examination of the Gold Coast specimens revealed the fact that birds from the coastal district were all *D. a. atactus*, those from the interior (the Hinterland) all *D. a. divaricatus*. Thus we do not have, as it first appeared, two subspecies inhabiting the same country.

A doubt as to the advisability of keeping *Dicrurus adsimilis divaricatus* (*Dicrurus afer* auctorum) separate from *D. adsimilis adsimilis* induced me to make a very thorough examination of these two forms, and the splendid material in the British Museum has enabled me to decide this point to my satisfaction.

D. adsimilis divaricatus is admittedly only distinguished from the typical form by its relatively smaller size, and whereas the former bird has an enormous range, the latter species is confined to South Africa.

"South Africa" is given as the type locality of *D. a. adsimilis,* whereas the type locality of *D. a. divaricatus* is Senegal; this is fortunate, for whereas the average wing-measurement of birds from Senegal is 129 mm., that of Cape Colony birds is 135·4 mm. The Drongos in northern Africa are obviously a smaller race than those in South Africa, but, as so often happens, the birds from the meeting-ground (Angola on the west coast and the Transvaal on the east coast) approach one another very closely in size. In fact, it is exceedingly difficult to say for certain to which form the Angola birds in particular belong.

Mr. Oberholser, in his review of the subspecies of *D. adsimilis* (Proc. U.S. Nat. Mus. xxviii. 1905, pp. 918–920), noticed the same fact in the specimens from Angola which he examined, and wrote (*l. c.* p. 920): "Examples from Angola are larger than those from more northern localities, and show in this a vergence toward true *adsimilis*, but they appear to be undoubtedly nearer *divaricatus*." I agree with Oberholser that the birds from Senegal, Senegambia, Nubia, and Somaliland seem to be the same as those from German East Africa and the Zambesi River, so that the name of *divaricatus* Lichtenstein, based on specimens from Senegambia, becomes available for this race.

I am by no means so certain that the Angola birds are best included with the northern form, for although birds having wing-measurements of only 128 mm. are found there, yet when an average is taken it is distinctly higher than the average wing-measurement of *D. a. divaricatus*. However, taking into consideration the geographical distribution of certain African forms which show a tendency to stretch from East Africa through Rhodesia into Angola, I have united the Angola birds with the North and East African race.

I would also mention that from East Africa I have found two skins, one from Tati in southern Matabeleland and the other from the Limpopo river, with wings measuring 139 mm.: although in the district inhabited by *divaricatus* these two examples, if examined without prejudice, can only be referred to the large South African race, *D. a. adsimilis*.

Thus in both West and East Africa the "lumper" can undoubtedly make out a good case for uniting *D. a. divaricatus* with *D. a. adsimilis*.

The attached table will assist future workers to determine which course they prefer to follow. For my part I consider the forms are best kept separate, and the entire group is now arranged in the Bird-Room collection on the lines laid down in this short monograph.

3. Dicrurus adsimilis adsimilis.

Corvus adsimilis Bechst. Latham, Allgem. Uebers. Vögel, ii. 1794, p. 362—Type locality: South Africa.

Chief characters. Entire upper parts glossed with blue. Size large. Wing-measurements 130–141 mm. (for average see attached table). Quill-lining generally light, contrasting strongly with under wing-coverts, but this character is subject to a certain amount of variation; tail long and markedly forked; bill heavy.

Range. Cape Colony, Damaraland, Natal, Zululand. Single birds have been obtained (1) on the Limpopo river ("Vlei poort"), (2) at Tati on the borders of southern Rhodesia and Bechuanaland, both in the country inhabited by *D. a. divaricatus.*

Number of skins in the British Museum: 37.

Table of wing-measurements of *Dicrurus adsimilis adsimilis.*

	No. of skins.	Adult skins.	Variation in wing-measurement of adults.	Average wing-measurement of adults.
Cape Colony	13	9	132–139	135·4
Damaraland	11	9	131–139	134·5
Natal	8	5	130–141	135·6
Zululand	3	1	——	134
Orange Free State ...	1	1	——	140
*Limpopo River	1	1	——	139
*S. Matabeleland	1	1	——	139

* These districts come into the range of *D. a. divaricatus.*

4. Dicrurus adsimilis divaricatus.

Muscicapa divaricata Lichtenstein, Verz. Doubl. Zool. Mus. Berlin, 1823, p. 52—Type locality: Senegal.

Chief characters. Upper parts glossed with blue. Size smaller. Wing-measurements 115–136 mm. (for average see attached table). Bill slightly smaller. Quill-lining generally light, but this character is subject to a certain amount of variation, freshly moulted quills having a much darker lining than old quills, which wear lighter.

Range. Senegal, Portuguese Guinea, Gold Coast, Nigeria, Angola, Transvaal, Swaziland, Bechuanaland, N. Rhodesia, S. Rhodesia, Portuguese East Africa, Nyasaland, Zanzibar, the late German East Africa, British East Africa, Uganda, Abyssinia, Somaliland, Sudan.

Number of skins in the British Museum: 170.

Table of wing-measurements of *Dicrurus adsimilis divaricatus.*

	No. of skins.	Adult skins.	Variation in wing-measurement of adults.	Average wing-measurement of adults.
Senegal (typical birds)	12	9	121–134	129
Portuguese Guinea...........	3	3	125–133	129·3
Gold Coast (*Hinterland*) ...	5	4	122–130	123·2
Nigeria	6	4	124–131	129
Angola	6	5	128–136	132
Transvaal	10	7	125–136	131·3
Swaziland	1	0	——	——
Bechuanaland	1	0	——	——
N. Rhodesia & S. Rhodesia (Mashonaland, Gazaland, and Matabeleland).........	12	10	125–131	127·6
Portuguese E. Africa (Zambesi specimens)	17	11	115–131	122·7
Nyasaland	10	4	122–132	126·2
Zanzibar	1	1	——	124
The late *German E. Africa* .	5	4	118–124	122·2
British E. Africa	16	14	117–134	121·9
Uganda	11	10	120–133	127·7
Abyssinia	21	15	119–132	124
Somaliland.....................	20	16	118–129	122·1
Sudan (White Nile)	13	10	119–131	123·7

5. **Dicrurus adsimilis atactus.**

Dicrurus modestus atactus Oberholser, Proc. U.S. Nat. Mus. xxii. 1899, p. 35—Type locality: Fantee, Gold Coast.

Chief characters. Upper parts, head, neck, and entire back glossed with deep velvety-blue. Size large. Wing-measurements of thirty-five specimens from the type locality: variation 122–138 mm., average 127·7 mm. Wing-measurements of forty-four adult skins from West Africa (including typical birds): variation 122–138 mm., average 128·2 mm. Quill-lining dark, showing no variation; bill heavy; tail markedly forked. Easily distinguished from *D. m. coracinus*, the other large mainland species, by having the nape and back glossed instead of dull, and by having a longer bill.

Range. Sierra Leone, Liberia, Gold Coast (typical), Togoland.

Number of skins in the British Museum: 51.

6. Dicrurus atripennis.

Dicrurus atripennis Swains. Birds West Africa, i. 1837, p. 256—Type locality: Sierra Leone.

Chief characters. Upper parts and breast highly glossed with steel-blue (more green than blue). Size rather large. Wings 106–122 mm., average of twenty-three skins 113·1 mm.; tail almost square.

Range. Sierra Leone (typical), Gold Coast, Northern Nigeria, Cameroon, Gaboon, Belgian Congo.

Number of skins in the British Museum: 26 (typical locality not represented).

7. Dicrurus sharpei.

Dicrurus sharpei Oustalet, N. Arch. Mus. Paris, 1879, p. 97—Type locality: Gaboon.

Chief characters. Upper parts blue, not highly glossed, the blue deeper and duller than in *atripennis*. Smaller. Wings 101–112 mm., average of eighteen skins 106·5 mm.; tail square and shorter than in *atripennis*.

Range. Senegal, Portuguese Guinea, Gold Coast, Nigeria, Cameroon, Gaboon (typical), Belgian Congo, N. Angola.

Number of skins in the British Museum: 18.

8. Dicrurus ludwigi.

Edolius ludwigi Smith, S. Afr. Quart. Journ. 1834, p. 144—Type locality: Port Natal.

Chief characters. Entire upper and under parts glossed with greyish-green. Size small: wings 94–107 mm., average of twenty-two skins with a wing-measurement of 101·2 mm. Quill-lining dark; tail distinctly forked. It is distinguished from *D. atripennis* by its shorter, narrower bill and by the more forked tail, and by having the outer tail-feathers more angular.

Range. Natal (typical), Zululand, Portuguese East Africa, Rhodesia, Nyasaland, the late German East Africa, Belgian Congo.

Number of skins in the British Museum: 23.

XIV.—*A Nominal List of the Birds at present known to inhabit Siam.* By Count Nils Gyldenstolpe, D.Sc., F.M.B.O.U.

The knowledge of the bird fauna of Siam has increased much during the last twenty years, and numerous species and subspecies have been added to the birds formerly known from that country.

A connected account of the Birds of the kingdom of Siam has up to the present time never been published, and the author has therefore prepared the following nominal list of those now known to inhabit that territory. Some years ago its bird fauna was very poorly known, and only small collections had ever reached European museums. Recently, however, several large collections have been brought together by ornithologists, and these have made valuable contributions to our knowledge of the fauna of that interesting country.

Since the foundation of the Natural History Society of Siam in February 1913, several European residents, as well as some Siamese gentlemen, have made great contributions to the knowledge of ornithology in Siam, and among those I especially want to mention are Messrs. W. J. F. Williamson, E. Eisenhofer, and E. G. Herbert.

Mr. Cecil Boden Kloss, of the Federated Malay States Museums, and the present author, have undertaken some ornithological exploring expeditions to more or less unknown districts in Siam, and a fairly large material of Siamese birds has now been collected and properly examined. However, much work remains to be done before we can have a definite idea of the bird fauna of Siam. The country is not a well-defined zoo-geographical province, and the fauna shows intermediate characters, the Indo-Burmese element being predominant in the northern and central parts, while Indo-Malayan forms are largely represented in the southern districts.

At the moment of writing about 730 species and subspecies of birds are recorded from Siamese territory, but as I have already stated, much work remains to be done before we shall be able to give a complete account of the bird fauna. But in spite of that, the publication of a nominal list of the birds at present known to inhabit Siam may be of some use to future workers on the Ornithology of the country, and no apology seems to be needed for publishing such a list.

As in my paper on the "Mammals at present known to inhabit Siam," no bulky list of synonyms has been added to each form, but references to the original description of the species and subspecies is given in all cases, so that they may easily be looked up and studied. The type-localities have also been mentioned, but as several of the older authors either did not fix localities or gave wrong and misleading information as to where their new species had been collected, I have in various cases given the restricted type-localities instead of the original and wrong ones. A few brief remarks have been attached to each species and subspecies as to their geographical distribution in the country, and the divisions used are those drawn up and defined by Boden Kloss in his paper "Zoo-geographical divisions for Siam" (Journ. Nat. Hist. Soc. Siam, vol. i. 1915, No. 4, p. 250), though they have been slightly modified.

My list has chiefly been prepared with the aid of the material that I collected during my two journeys in various parts of Siam. This material is now being kept at the Royal Natural History Museum in Stockholm and comprises some 2500 specimens. But I have of course also gone carefully through and consulted the literature on the subject found in various scientific periodicals, and from these papers I have got much valuable information. Several of the recently described species and subspecies have, however, not been accessible for examination, and I am therefore rather uncertain about their validity. They have, however, all been mentioned, though some may have later to be placed among the synonyms of other forms.

Family Corvidæ.

Corvus coronoides hainanus Stresem.

Corvus coronoides hainanus Stresemann, Verh. Ornith. Ges. in Bayern, xii. 1916, p. 286 : Hoihow, Hainan.

Commonly distributed throughout the whole country, though less so in the dense evergreen jungles.

Corvus insolens Hume.

Corvus insolens Hume, Stray Feathers, ii. 1874, p. 480 : Burma.

In the British Museum (Natural History) there is a specimen collected by Mouhot in Siam. Also observed in Bangkok by the present author.

Corvus compilator Richm.

Corvus compilator Richmond, Proc. U.S. Nat. Mus. xxvi. 1903, p. 518.

This is a new name for Horsfield's *Corvus enca* (Trans. Linn. Soc. London, xiii. 1820, p. 164), originally described from Java. Recorded from Bukit Besar, Biserat, and Jalor in peninsular Siam.

Urocissa occipitalis magnirostris Blyth.

Psilorhinus magnirostris Blyth, Journ. Asiat. Soc. Bengal, xv. 1846, p. 27 : Yamadong Hills, Arakan.

This race inhabits northern, western, and eastern Siam, where it seems to be tolerably common though rather shy. Its southern limits of range have not yet been properly ascertained.

Cissa chinensis Bodd.

Coracias chinensis Boddaert, Tabl. Pl. Enl. 1783, p. 38 : China.

Fairly common among the hills of northern Siam. Also recorded by Gairdner from the provinces of Ratburi and Petchaburi, and by Herbert from the neighbourhood of Sriracha, S.E. Siam.

Dendrocitta rufa Scop.

Lanius rufus Scopoli, Del. Floræ et Faunæ Insubr. ii. 1786, p. 86 : China.

Rather common in the dry forests of northern and eastern Siam. A single specimen has also been recorded from Bangkok by Parrot (Verh. Ornith. Ges. in Bayern, viii. 1907, p. 119), but no recent collectors have met with it at that locality.

Dendrocitta sinensis assimilis Hume.

Dendrocitta assimilis Hume, Stray Feathers, v. 1877, p. 117 : Tenasserim.

A single specimen was recorded by the present author from Koon Tan, but Herbert has also met with the bird at Chan Tuek and at Menam Kabren.

Crypsirhina varians Lath.

Corvus varians Latham, Ind. Ornith. Suppl. 1801, p. xxvi : Java.

Commonly distributed throughout the whole country.

Platysmurus leucopterus Temm.

Glaucopsis leucopterus Temminck, Planches Col. Nr. 265, 1824 : Sumatra.

Only met with in the southernmost parts of peninsular Siam, where specimens have been collected in Trang and at Ban Kok Klap in the province of Bandon.

Garrulus leucotis Hume.

Garrulus leucotis Hume, Proc. Asiat. Soc. Bengal, 1874, p. 106 : Burma.

Fairly common in the open hill-forests of northern Siam, where specimens have been obtained at Koon Tan, Pak Koh, Chum Poo, Bang Hue Pong, Pak Pan, and in north-western Siam at Doi Par Sakeng.

Family Dicruridæ.

Bhringa remifer Temm.

Edolius remifer Temminck, Planches Col. Nr. 178, 1823 : Java.

Apparently rare in Siam and hitherto only recorded from Klong Menao in the south-eastern and from Koon Tan and Doi Par Sakeng in the northern parts. Stuart Baker has recently described a new subspecies under the name *Bhringa remifer peracensis* (Bull. Brit. Ornith. Club, xxxix. 1918, p. 18), and he states that the specimen from Klong Menao is intermediate between *Bhringa remifer remifer* and *Bhringa remifer peracensis*.

Dissemurus paradiseus paradiseus Linn.

Cuculus paradiseus Linnæus, Syst. Nat. Ed. xii. 1766, p. 172 : Siam.

The typical race of the Racket-tailed Drongo is apparently confined to the southernmost districts, being replaced in the north by some allied forms, which only differ from each other by having a more or less developed crest.

Dissemurus paradiseus rangoonensis Gould.

Edolius rangoonensis Gould, P. Z. S. Lond. 1836, p. 5 : Rangoon, Burma.

Rather common in suitable localities throughout the north of Siam.

Chibia hottentotta Linn.

Corvus hottentottus Linnæus, Syst. Nat. Ed. xii. 1766, p. 155.

Recorded from northern, central, and eastern Siam, but hitherto not obtained in the southern parts of the country. Most common in the northern districts.

Chaptia ænea malayensis A. Hay.

Chaptia malayensis A. Hay, Journ. Asiat. Soc. Bengal, xv. 1846, p. 294 : Malacca.

The Siamese specimens are somewhat intermediate between this form and the northern typical race, the type-locality of which may be considered to be Bengal. The Bronzed Drongo seems to be fairly common in suitable localities in northern Siam. It has also been met with in the eastern districts, as at Non Luum south of Korat, though it seems to be rather rare there. The specimens from the eastern parts are larger than those from the northern localities, and may possibly belong to a distinct subspecies.

Dicrurus annectens siamensis Kloss.

Dicrurus annectens siamensis Kloss, Ibis, 1918, p. 226: Koh Lak, S.W. Siam.

Apparently not common in Siam, and very few records are available. Specimens have, however, been obtained in eastern, south-eastern, central, and peninsular Siam besides at the type-locality.

Buchanga leucophæa disturbans Stuart Baker.

Dicrurus leucophæus disturbans Stuart Baker, Nov. Zool. xxv. 1918, p. 293: Amherst.

This form inhabits the Malay Peninsula as far north as Bangkok and extends east into Siam, where, however, it seems to be rather rare, and has hitherto only been recorded from Lat Bua Kao (E. Siam), Koh Lak (S.W. Siam), and the island of Salanga, or Puket as it is called by the Siamese.

Buchanga atra cathœca Swinh.

Dicrurus cathœcus Swinhoe, P. Z. S. Lond. 1871, p. 377: China.

Of this race only a single specimen has hitherto been recorded from Siamese territory, viz. at Bang Hue Pong in northern Siam.

Buchanga atra longus Bp.

Dicrurus longus Bonaparte, Consp. Gen. Av. i. 1850, p. 352: Java.

Apparently quite common in suitable localities throughout the whole country.

Buchanga cineracea nigrescens Oates.

Dicrurus nigrescens Oates in Hume's Nests and Eggs Ind. Birds, ed. ii. 1889, p. 208: Rangoon, Burma.

Inhabits northern and central Siam, at least those parts of the country situated north of the latitude of Bangkok.

Buchanga cineracea mouhoti Wald.

Buchanga mouhoti Walden, Ann. & Mag. Nat. Hist. (4) v. 1870, p. 220: Cambodia.

Replaces the foregoing in eastern and south-eastern Siam, where specimens have been collected at Ok Yam, Klong Yai, and on the islands of Koh Chang and Koh Klum.

Buchanga leucogenis Wald.

Buchanga leucogenis Walden, Ann. & Mag. Nat. Hist. (4) v. 1870, p. 219: Malacca.

Not common, and confined to peninsular and south-eastern Siam. The northern limits of its range are still not ascertained, but this species has been met with at Bangkok. The birds from Salanga or Puket have been separated by Reichenow (Nomencl. Mus. Hein. 1890, p. 69) under the name of *Dicrurus leucogenis* var. *salangensis*, but this name probably only becomes a synonym of the typical form. I have, however, been unable to examine specimens from that island.

Family Oriolidæ.

Oriolus indicus indicus Jerd.

Oriolus indicus Jerdon, Ill. Ind. Ornith. pl. 15, 1847: Malabar.

Commonly, though locally, distributed throughout the whole country.

Oriolus indicus tenuirostris Blyth.

Oriolus tenuirostris Blyth, Journ. Asiat. Soc. Bengal, xv. 1846, p. 48: Burma.

Obtained in northern Siam at Doi Nga Chang near Lakorn Lampong, and at Menam Kabren and Klong Bang Lai in the peninsular parts.

Oriolus luteolus thaiacous *.

Oriolus luteolus thaiacous Hartert, Bull. Brit. Ornith. Club, xxxviii. 1918, p. 63.

Like *O. indicus indicus* this species occurs throughout the whole country, and it seems to be rather more common than that form.

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* Formerly known as *Oriolus melanocephalus* Linn.

Oriolus xanthonotus Horsf.

Oriolus xanthonotus Horsfield, Trans. Linn. Soc. Lond. xiii. 1821, p. 152: Java.

A southern form, hitherto only recorded from Trang in peninsular Siam, where it is stated to be rare.

Family Eulabetidæ.

Gracula javana javana Cuv.

Eulabes javanicus Cuvier, Règne Anim. i. 1829, p. 377: Java.

A southern form, inhabiting the Malay Peninsula and islands. In Siam it has been found at Klong Wang Hip, Klong Bang Lai, Maprit, Biserat, and Jalor, as well as on the islands of Koh Muk and Pulu Lontar.

Gracula javana intermedia A. Hay.

Gracula intermedia A. Hay, Madras Journ. Lit. Sci. xiii. pt. 2, 1844, p. 157: N. India and Arakan.

Very common throughout the whole of Siam, extending as far south as to Trang, but the southern limits of the range are still not ascertained.

Aplonis panayensis strigatus Horsf.

Turdus strigatus Horsfield, Trans. Linn. Soc. Lond. xiii. 1821, p. 148: Java.

Hitherto only found in peninsular Siam, where specimens have been recorded from Patani, Ban Sai Kau, Nawngchik, Biserat, Jalor, Patelung, Trang, and from the islands Koh Samui, Koh Pennan, and Puket. The Siamese specimens are intermediate between *A. panayensis strigatus* Horsf. and *A. panayensis affinis* A. Hay (Journ. Asiat. Soc. Bengal, xv. 1846, p. 36) from Tipperah, Cachar, Arakan, and Tenasserim, and ought to be known as *Aplonis panayensis strigatus > affinis*.

Family STURNIDÆ.

Spodiopsar leucocephalus leucocephalus Gigl. & Salvad.

Acridotheres leucocephalus Giglioli & Salvadori, Atti R. Acc. Sci. di Torino, v. 1869, p. 273 : Cochin China.

Specimens of this bird have been obtained at Menam Kabren, Koh Lak, and at Lat Bua Kao in eastern Siam.

Spodiopsar malabaricus nemoricolus Jerd.

Sturnia nemoricola Jerdon, Ibis, 1862, p. 22 : Upper Burma.

Besides the neighbourhood of Bangkok this bird has been recorded from Menam Kabren and from Koon Tan in northern Siam.

Sturnia sinensis Gm.

Oriolus sinensis Gmelin, Syst. Nat. i. 1788, p. 394 : China.

A winter visitor to Siam. Recorded several times from peninsular Siam, also met with at Bangkok, though curiously enough not yet in the northern parts of the country.

Sturnia sturnina Pall.

Gracula sturnina Pallas, Reise Russ. Reichs, iii. 1776, p. 695 : Dauria.

Also a winter visitor to Siam and apparently rather rare, as it has hitherto only been obtained at Menam Kabren, Bangkok, and on Puket.

Ampeliceps coronatus Blyth.

Ampeliceps coronatus Blyth, Journ. Asiat. Soc. Bengal, xi. 1842, p. 194 : Tenasserim.

Recorded from northern Siam as well as from Trang and Puket. Mostly found in evergreen forests.

Acridotheres tristis Linn.

Paradisea tristis, Linnæus, Syst. Nat. Ed. xii. 1766, p. 167 : "Habitat in Philippinis."

Apparently quite common in the towns and villages throughout the whole country. Mostly found in cultivated ground.

Graculipica nigricollis Payk.

Gracula nigricollis Paykull, Kongl. Svenska Vetenskaps-akad. Nya Handlingar, xxviii. 1807, p. 291 : Canton, China.

The Black-necked Mynah is very common in suitable localities throughout the whole country. It never affects the real forests, but is found in orchards and cultivated land near the towns and villages.

Æthiopsar fuscus fuscus Wagl.

Pastor fuscus Wagler, Syst. Avium, Pastor sp. 6, 1827 : India.

A southern form hitherto only recorded from peninsular Siam, where specimens have been collected at Ban Sai Kau, Biserat, Jalor, Bukit Besar, Patelung, and Singora.

Æthiopsar fuscus grandis Moore.

Acridotheres grandis Moore in Horsfield & Moore, Cat. Birds Hon. East Ind. Comp. Mus. ii. 1856–1858, p. 537 : Sumatra.

Commonly distributed throughout the whole country.

Sturnopastor superciliaris superciliaris Blyth.

Sturnopastor superciliaris Blyth, Journ. Asiat. Soc. Bengal, xxxii. 1863, p. 77 : Burma.

Only a single authentic specimen of the Burmese Pied Mynah has up to the present time been recorded from Siam, where it was obtained near Koon Tan.

Sturnopastor superciliaris floweri Sharpe.

Sturnopastor floweri Sharpe, Bull. Brit. Ornith. Club, vii. 1897. p. xvii : Tachin, C. Siam.

Quite common on suitable ground in central, south-eastern, and south-western Siam, but not obtained in the north. Mostly found on cultivated ground and on the great alluvial plain along the Menam Chao Phya river.

Family Ploceidæ.

Ploceus manyar flaviceps Less.

Ploceus flaviceps Lesson, Traité d'Orn. 1831, p. 435 : Pondicherry.

Apparently distributed throughout the whole country, as authentic specimens have been collected at Bangkok and at Chienghai in the north.

Ploceus passerinus infortunatus Hart.

Ploceus passerinus infortunatus Hartert, Nov. Zool. ix. 1902, p. 477: Sungei Lebeh.

Like the former species this Weaver-bird is found throughout the whole of Siam, specimens having been recorded from Chienghai and Raheng in the north, from Ayuthia and Bangkok in central, from the provinces of Ratburi and Petchaburi in south-western, and from Ban Sai Kau and Biserat in peninsular Siam.

Ploceella javanensis Less.

Loxia javanensis Lesson, Traité d'Orn. 1831, p. 446: Java.

In the British Museum (Natural History) there is a specimen procured by Schomburgk in Siam. The bird has also been mentioned by some of the older authors from that country (*vide* P. Z. S. Lond. 1859, p. 151, and Ibis, 1864, p. 257), but, as it has never been obtained nor recorded by any recent collector, its occurrence in a wild state in Siam is very uncertain.

Munia maja Linn.

Loxia maja Linnæus, Syst. Nat. Ed. xii. 1766, p. 301: Malacca.

Recorded from Patani, Ban Sai Kau, Biserat, and Jalor in peninsular Siam.

Munia atricapilla rubronigra Hodgs.

Munia rubronigra Hodgson, Asiat. Res. xix. 1836, p. 153: Nepal.

Authentic specimens of this form have only been procured from Chienghai and Chiengsen in the most northern parts of the country, but it has also been recorded from several places both in central and peninsular Siam, though under the name of *Munia atricapilla*.

Munia punctulata topela Swinh.

Munia topela Swinhoe, Ibis, 1863, p. 380 : Formosa.

Probably only found in northern Siam, where specimens have been obtained in the neighbourhood of Chienghai.

Munia punctulata subundulata Godw. Aust.

Munia subundulata Godwin Austen, P. Z. S. Lond. 1874, p. 48 : Manipur.

Hitherto only met with at Bangkok, Sriracha, and Koh Lak.

Uroloncha acuticauda acuticauda Hodgs.

Munia acuticauda Hodgson, Asiat. Res. xix. 1836, p. 153 : Nepal.

Generally distributed throughout the whole country, and also found on several of the islands in the Gulf of Siam as well as on Puket.

Uroloncha acuticauda squamicollis Sharpe.

Uroloncha squamicollis Sharpe, Cat. Birds Brit. Mus. xiii. 1890, p. 359 : Formosa.

A few specimens were obtained by the present author at Koon Tan and Bang Hue Pong, places in northern Siam.

Amandava amandava Linn.

Fringilla amandava Linnæus, Syst. Nat. Ed. xii. 1766, p. 319 : Bengal.

Mentioned by several of the older authors as inhabiting Siam, but, as no specimens have been obtained by any recent collectors, its occurrence there is uncertain, and the recorded specimens most certainly are only escaped cage-birds.

Family Fringillidæ.

Carpodacus erythrinus roseatus Hodgs.

Pyrrhulinota roseata Hodgson, P. Z. S. Lond. 1845, p. 36 : Nepal.

Hitherto only recorded from the neighbourhood of Koon Tan, N. Siam.

Passer flaveolus Blyth.

Passer flaveolus Blyth, Journ. Asiat. Soc. Bengal, xiii. 1844, p. 946 : Arakan.

Obtained in several parts of Siam, in the northern, central, and south-western districts.

Passer montanus malaccensis Dub.

Passer montanus malaccensis Dubois, Faune Vertéb. de la Belgique, 1887, p. 574 : Malacca.

Commonly distributed in suitable localities throughout the country.

Passer montanus saturatus Stejn.

Passer saturatus Stejneger, Proc. U.S. Nat. Mus. 1885, p. 19 : Liu Kiu Islands.

An authentic specimen of this species has been obtained by Herbert at Bangkok.

Melophus melanicterus Gm.

Fringilla melanictera Gmelin, Syst. Nat. i. 1788, p. 910 : "Habitat in Macao."

The only record I can find of the occurrence of the Crested Bunting in Siam is that by Oates ('Handbook to the Birds of British Burma'), who speaks of it as occurring in "South China, *Siam*, and the Indo-Burmese countries, extending along the Himalayas and over a great part of India." It has, however, never been found by any recent collector in Siam, and Oates's statement ought perhaps to be referred to Tenasserim, where it has been found on one occasion.

Emberiza aureola Pall.

Emberiza aureola Pallas, Reise Russ. Reichs, ii. 1773, p. 711 : Siberia.

A winter visitor to Siam, where it has been found several times in different parts of the country.

Emberiza rutila Pall.

Emberiza rutila Pallas, Reise Russ. Reichs, iii. 1776, p. 698 : Mongolia.

A winter visitor, though apparently rather rare, as it has only been met with on a few occasions, viz., at Den Chai in the north and at Sai Yoke in western Siam. Gairdner has also observed it in the province of Ratburi.

Family ALAUDIDÆ.

Alauda gulgula sala Swinh.

Alauda sala Swinhoe, Ibis, 1870, p. 355 : Hainan.

Sparsely found in various parts of Siam.

Mirafra cantillans williamsoni Stuart Baker.

Mirafra cantillans williamsoni Stuart Baker, Bull. Brit. Ornith. Club, xxxvi. 1915, p. 9 : Bangkok.

Originally described from Bangkok, where it breeds. Also recorded from Lat Bua Kao in eastern Siam.

Mirafra assamica marionæ Stuart Baker.

Mirafra assamica marionæ Stuart Baker, Bull. Brit. Ornith. Club, xxxvi. 1915, p, 34 : Ayuthia, C. Siam.

Besides the type locality this form has also been obtained at Chan Tuek, Menam Kabren, Koh Lak, and at Lat Bua Kao.

Mirafra microptera Hume.

Mirafra microptera Hume, Stray Feathers, i. 1873, p. 483 : Thayetmo.

Very common in suitable localities throughout northern Siam, whence I have examined large series.

Family MOTACILLIDÆ.

Motacilla alba leucopsis Gould.

Motacilla leucopsis Gould, P. Z. S. Lond. 1837, p. 78 : India.

Breeds from Amur, Mandchuria, E. Mongolia to N.W. China, and in N.E. Tibet, but is found during the winter months in Siam, whence it has been recorded several times.

Motacilla flava taivanus Swinh.

Budytes taivanus Swinhoe, P. Z. S. Lond. 1863, p. 334: Formosa.

A winter visitor to Siam, where it, however, seems to be very rare, as it has only been met with at Koh Lak in south-western Siam.

Motacilla flava borealis Sundev.

Motacilla flava var. 3. *borealis* Sundevall, Kongl. Svenska Vetenskapsakad. Handl. 1840, p. 53: Lappland.

This form is only a winter visitor to Siam, whence it has been recorded several times, specimens having been collected at Chong, Ban Sai Kau, Nawngchik, Patani, Bangkok, and northern Siam.

Motacilla boarula melanope Pall.

Motacilla melanope Pallas, Reise Russ. Reichs, iii. 1776, p. 696: Dauria.

Common in various parts of Siam during the winter months.

Limonidromus indicus Gm.

Motacilla indica Gmelin, Syst. Nat. i. 1788, p. 962: India.

Locally found during the winter months, though always rather rare. Specimens collected at Trang, Lat Bua Kao, Bangkok, Sriracha, Pak Pan, and Chienghai.

Anthus cervina Pall.

Motacilla cervina Pallas, Zoogr. Rosso-Asiat. i. 1827, p. 511: Siberia.

Apparently rather rare, and hitherto only obtained at Bangkok and Koh Lak. A winter visitor.

Anthus spinoletta japonicus Temm. & Schleg.

Anthus pratensis japonicus Temminck & Schlegel in Siebold's Fauna Japon., Aves, 1847, p. 59, pl. 24: Japan.

Mentioned by some of the older authors (*vide* P. Z. S. 1859, p. 151, and Ibis, 1864, p. 249—under the name *A. pratensis*) as found in Siam, but never obtained by any recent collector.

Anthus maculatus Jerd.

Anthus maculatus Jerdon, Birds of India, iii. 1864, p. 873: India.

A winter visitor to Siam and the neighbouring countries. Fairly common in suitable localities throughout the country.

Anthus richardi striolatus Blyth.

Anthus striolatus Blyth, Journ. Asiat. Soc. Bengal, xvi. 1847, p. 435: Darjeeling.

Only obtained during the winter months in northern Siam, where specimens have been collected at Koon Tan, Den Chai, and Pak Pan.

Anthus richardi malayensis Eyton.

Anthus malayensis Eyton, P. Z. S. Lond. 1839, p. 104: Malacca.

Found in several parts of peninsular, central, and eastern Siam.

Anthus richardi richardi Vieill.

Anthus richardi Vieillot, Nouv. Dict. d'Hist. Nat. xxvi. 1818, p. 491: France.

The typical form of Richard's Pipit seems to be very rare in Eastern Asia. In Siam it has only been met with, and recorded by Kloss, at Lat Bua Kao, Tachin, and Koh Lak.

Family NECTARINIIDÆ.

Æthopyga saturata anomala Richm.

Æthopyga anomala Richmond, Proc. U.S. Nat. Mus. xxii. 1900, p. 318: Khaw Song, Trang, S.W. Siam.

Besides the type specimen this bird has only been collected at Khao Nom Plu in Trang by Abbott.

Æthopyga temminckii S. Müll.

Nectarinia temminckii S. Müller, Verhandl. Nat. Ges. Ned. Indië, Land- en Volkenk. 1843, p. 173 (note): Sumatra.

A single male specimen of this bird was obtained by Robinson and Kloss at Chong in Trang, S.W. Siam.

Æthopyga siparaja siparaja Raffl.

Certhia siparaja Raffles, Trans. Linn. Soc. Lond. xiii. 1820, p. 299 : Sumatra.

The typical form has only been met with and collected at Chong and Lamra, both places situated in Trang, S.W. Siam.

Æthopyga siparaja cara Hume.

Æthopyga cara Hume, Stray Feathers, ii. 1875, p. 473 : Tenasserim.

This beautiful Sun-bird seems to be rather common in suitable localities in several parts of Siam. Specimens have been recorded from the northern districts as well as from the provinces of Ratburi and Petchaburi. It also occurs on several of the islands in the Gulf of Siam, and it has been obtained on the island of Terutau and on Puket.

Æthopyga sanguinipectus Wald.

Æthopyga sanguinipectus Walden, Ann. & Mag. Nat. Hist. (4) xv. 1875, p. 400: Tonghoo Hills.

Hitherto only recorded from Kao Nawng in the province of Bandon and from Muang Wang in northern Siam.

Æthopyga dabryi J. Verr.

Nectarinia dabryi J. Verreaux, Rev. & Mag. Zool. 1867, p. 173, pl. 15 : N. China.

A single specimen of this Sun-bird has been procured at Koon Tan in northern Siam by the present author.

Arachnechthra asiatica Lath.

Certhia asiatica Latham, Ind. Ornith. i. 1790, p. 288 : India.

Apparently quite common in suitable localities throughout the country.

Leptocoma hasselti Temm.

Nectarinia hasselti Temminck, Planches Col. Nr. 376, fig. 3, 1825 : Java.

On the mainland this species has hitherto only been found at Klong Menao and Ok Yam in south-eastern Siam, but it has been recorded from several of the islands in the Gulf of Siam, viz., Koh Mensi East, Koh Kut, and Koh Pennan. Commonly distributed on the island of Terutau and on Puket.

Cyrtostomus pectoralis Horsf.

Nectarinia pectoralis Horsfield, Trans. Linn. Soc. Lond. xiii. 1822, p. 167 : Java.

Hitherto only recorded from Trang in peninsular Siam and from the island of Puket.

Cyrtostomus flammaxillaris Blyth.

Nectarinia flammaxillaris Blyth, Journ. Asiat. Soc. Bengal, xiv. 1845, p. 557 : Tenasserim.

One of the most common Sun-birds throughout Siam proper and also recorded from several of the islands in the Gulf of Siam and from those off the western coast of the peninsula.

Anthreptes hypogrammica S. Müll.

Nectarinia hypogrammica S. Müller, Verhandl. Nat. Ges. Ned. Indië, Land- en Volkenk. 1843, p. 173 : Sumatra.

A southern form hitherto only obtained in the peninsular parts of the country, where it seems to be rare. Specimens have been collected in Trang and at Bukit Besar, Nawngcik, and Kao Nawng.

Anthreptes simplex S. Müll.

Nectarinia simplex S. Müller, Verhandl. Nat. Ges. Ned. Indië, Land- en Volkenk. 1843, p. 173 : Sumatra.

Very rare in Siam, where only a single male specimen has been obtained at Chong, Trang.

Anthreptes malacensis Scop.

Certhia malacensis Scopoli, Del. Floræ et Faunæ Insubr. 1786, p. 91 : Malacca.

Quite common throughout the whole country.

Anthreptes rhodolæma Shelley.

Anthreptes rhodolæma Shelley, Monogr. Nectariniidæ, 1878, p. 313 : Malacca.

Recorded by Robinson and Kloss (Ibis, 1911, p. 76) as being common in Trang, where specimens were obtained at Chong.

Chalcoparia singalensis koratensis Kloss.

Chalcoparia singalensis koratensis Kloss, Ibis, 1918, p. 218: Lat Bua Kao, E. Siam.

Originally described from eastern Siam, but this race is commonly distributed throughout the whole country.

Calcostetha calcostetha Jard.

Nectarinia calcostetha Jardine, Nat. Hist. Nectariniidæ, 1843, p. 263: "East Ind. Islands."

Hitherto only obtained on the islands of Puket and Terutau, off the western coast of peninsular Siam.

Arachnothera robusta Müll. & Schleg.

Arachnothera robusta Müller & Schlegel, Verhandl. Nat. Ges. Ned. Indië, Land- en Volkenk. 1843, p. 68, pl. ii. fig. 1: W. Sumatra.

Mentioned by Robinson and Kloss as being common in Trang.

Arachnothera longirostris longirostris Lath.

Certhia longirostra Latham, Ind. Ornith. i. 1790, p. 299: Bengal.

Apparently rather rare in peninsular Siam, where specimens have been collected at Trang, Ban Sai Kau, Ban Kok Klap, etc. Also found in northern Siam and on Puket, though always in limited numbers.

Arachnothera magna magna Hodgs.

Cinnyris magna Hodgson, Ind. Rev. 1837, p. 272: Nepal.

The northern typical race of this Spider-hunter has hitherto only been obtained in the neighbourhood of Chienghai.

Arachnothera magna aurata Blyth.

Arachnothera aurata Blyth, Journ. Asiat. Soc. Bengal, xxiv. 1855, p. 478: Pegu.

Fairly common in northern Siam, but also recorded from the south-eastern parts of the country.

Arachnothera affinis modesta Eyton.

Anthreptes modesta Eyton, P. Z. S. Lond. 1839, p. 105 : Malacca.

A southern form recorded as being rather scarce in Trang. Specimens have also been collected at Kao Nawng, Bukit Besar, and Nawngchik, places all situated in peninsular Siam.

Arachnothera chrysogenys Temm.

Nectarinia chrysogenys Temminck, Planches Col. Nr. 388, fig. 1, 1826 : Java.

A southern form recorded from the same localities as the last species.

Arachnothera flavigaster Eyton.

Anthreptes flavigaster Eyton, P. Z. S. Lond. 1839, p. 105 : Malacca.

Obtained at Chong (Trang) and on the island of Puket.

Family DICÆIDÆ.

Dicæum cruentatum siamensis Kloss.

Dicæum cruentatum siamensis Kloss, Ibis, 1918, p. 216 : Lat Bua Kao, E. Siam.

Recently described from specimens from eastern Siam, but this form, if distinct, probably inhabits Siam proper.

Dicæum cruentatum ignita Begbie.

Nectarinia ignita Begbie, Ann. & Mag. Nat. Hist. (1) xvii. 1846, p. 408 : Malacca.

Recorded from the islands of Terutau and Puket.

Dicæum trigonostigma Scop.

Certhia trigonostigma Scopoli, Del. Floræ et Faunæ Insubr. ii. 1786, p. 91 : China.

Hitherto only obtained in peninsular Siam, where specimens have been collected at Trang, Biserat, Jalòr, and in the province of Bandon. Also obtained on Terutau and Puket.

Dicæum chrysorrhæum Temm.

Dicæum chrysorrhæum Temminck, Planches Col. Nr. 478, 1829 : Java.

Apparently distributed throughout the whole country.

Dicæum ignipectus Hodgs.

Myzanthe ignipectus Hodgson, Journ. Asiat. Soc. Bengal, xii. 1843, p. 983: Nepal.

Extremely rare and hitherto only recorded from Patelung in peninsular, and from Koon Tan in northern Siam.

Dicæum minullus olivaceum Wald.

Dicæum olivaceum Walden, Ann. & Mag. Nat. Hist. (4) xv. 1875, p. 401: Tonghoo Hills.

An inhabitant of northern Siam, where it is quite common.

Prionochilus pencrussus ignicapillus Eyton.

Dicæum ignicapilla Eyton, P. Z. S. Lond. 1839, p. 105: Malay Peninsula.

Only recorded from peninsular Siam, where specimens have been collected at Tung Song, Chong, Bukit Besar, and Nawngchik.

Prionochilus maculatus Temm.

Pardalotus maculatus Temminck, Planches Col. Nr. 600, fig. 3, 1836: Borneo.

Obtained in peninsular Siam, where specimens have been recorded from Klong Wang Hip and from Kao Nawng in the province of Bandon.

Piprisoma modestum Hume.

Prionochilus modestus Hume, Stray Feathers, iii. 1875, p. 298: S. Tenasserim.

Locally distributed throughout the whole country, though rather rare.

Family Zosteropidæ.

Zosterops siamensis Blyth.

Zosterops siamensis Blyth, Ibis, 1867, p. 34: Tenasserim.

Recorded as an inhabitant of Siam, but not met with by any recent collector.

Zosterops palpebrosa auriventer Hume.

Zosterops auriventer Hume, Stray Feathers, vi. 1878, p. 519: Tavoy.

Recently recorded from Meklong. Otherwise it has been collected at Bukit Besar, Nawngchik, and at Tanjong Patani.

Zosterops tahanensis Grant.

Zosterops tahanensis Grant, Bull. Brit. Ornith. Club, xix. 1906, p. 10: Gunong Tahan.

Only found in peninsular Siam, where specimens have been obtained at Chong (Trang) and at Kao Nawng in the province of Bandon.

Family CERTHIIDÆ.

Pnoepyga pusilla Hodgs.

Pnoepyga pusilla Hodgson, P.Z.S. Lond. xiii. 1845, p. 25: Nepal.

Recorded from Kao Nawng in the province of Bandon, peninsular Siam.

Family SITTIDÆ.

Sitta cinnamoventris Blyth.

Sitta cinnamoventris Blyth, Journ. Asiat. Soc. Bengal, xi. pt. 1, 1842, p. 459: Himalayas.

Inhabits northern Siam. Even found in eastern Siam, where specimens have been collected at Non Luum, a small village south of Korat.

Sitta neglecta Wald.

Sitta neglecta Walden, Ann. & Mag. Nat. Hist. (4) v. 1870, p. 218: Karennee.

Rather common in northern and north-western Siam.

Dendrophila frontalis frontalis Swains.

Sitta frontalis Swainson, Zool. Illustr. i. pl. 2, 1820–21: Ceylon.

The typical race is rather abundant in the dry forests of northern Siam, specimens having been obtained at Koon Tan, Bang Hue Pong, Pak Koh, Saisket, and Doi Par Sakeng.

Dendrophila frontalis saturatior Hart.

Sitta frontalis saturatior Hartert, Nov. Zool. ix. 1902, p. 573 : Gunong Tahan.

Inhabits peninsular Siam, where specimens have been collected at Bukit Besar, Nawngchik, Bandon, Lamra, and on Puket. Northern limits of range not ascertained.

Family PARIDÆ.

Parus major cinereus Vieill.

Parus cinereus Vieillot, Nouv. Dict. d'Hist. Nat. xx. 1818, p. 316 : Batavia.

Apparently very rare in Siam. Specimens are recorded from the island of Puket and from Patani in the peninsula.

Parus spilonotus Blyth.

Parus spilonotus Blyth, Cat. Birds Mus. Asiat. Soc. 1849, p. 103 : Himalayas.

Quite recently obtained in northern Siam, where a single specimen was shot at Doi Nga Chang, south of Lakorn Lampang.

Melanochlora sultanea sultanea Hodgs.

Parus sultaneus Hodgson, Ind. Rev. i. 1837, p. 31: Nepal.

Locally distributed, though fairly common, in northern Siam. The specimens are somewhat intermediate between the typical form and that from the Malay Peninsula.

Melanochlora sultanea flavocristata Lafr.

Parus flavo-cristatus Lafresnaye, Mag. Zool. Cl. 2, pl. 80, 1837 : "Iles de la Sonde."

Recorded from several places in peninsular Siam, such as Trang, Bukit Besar, Nawngchik, Kao Nawng, and mentioned by Gairdner from Ratburi and Petchaburi.

Family LANIIDÆ.

Lanius tigrinus Drap.

Lanius tigrinus Drapiez, Dict. Class. Hist. Nat. xiii. 1828, p. 523 : Java.

A winter visitor to Siam, where it seems, however, to be rather rare. Only obtained up to the present time at Koon Tan in northern Siam and on the island of Terutau.

Lanius schach tephronotus Vig.

Collurio tephronotus Vigors, P. Z. S. Lond. 1831, p. 43 : Himalayas.

Sparsely found in Siam during the winter months, specimens having been obtained at Bang Hue Hom in the northern part.

Lanius nigriceps longicaudatus Gould.

Lanius longicaudatus Gould, P. Z. S. Lond. 1859, p. 151 : Siam.

Commonly distributed throughout central and peninsular Siam, but not found in the northern districts up to the present time.

Lanius collurioides collurioides Less.

Lanius collurioides Lesson, Voy. Bélang. 1834, p. 250 : Pegu.

Occurs throughout Siam. *Lanius hypoleucus siamensis*, named by myself, is probably only to be considered synonymous.

Otomela cristata cristata Linn.

Lanius cristatus Linnæus, Syst. Nat. Ed. x. 1758, p. 93 : Bengal.

The typical form of the Brown Shrike has been found during the winter in several parts of the country.

Otomela cristata superciliosa Lath.

Lanius superciliosus Latham, Ind. Ornith. Suppl., 1801, p. xx : Batavia.

Apparently a rare winter visitor to Siam. Specimens are recorded from Bangnara in peninsular Siam and from the island of Puket.

Otomela cristata lucionensis Linn.

Lanius lucionensis Linnæus, Syst. Nat. Ed. xii. 1766, p. 135 : Luzon.

Hitherto only obtained in northern Siam. A winter visitor.

Family PRIONOPIDÆ.

Platylophus ardesiaca Cab.

Lophocitta ardesiaca Cabanis, Mus. Hein. i. 1850, p. 219 : Sumatra.

A southern form hitherto only recorded from peninsular Siam, where specimens have been collected at Ban Kok Klap, Kao Nawng, and Hat Sanuk.

Hemipus picatus Sykes.

Muscicapa picata Sykes, P. Z. S. Lond. 1832, p. 85 : India.

Common in northern Siam, extending southwards at least to Trang.

Hemipus obscurus Horsf.

Muscicapa obscura Horsfield, Trans. Linn. Soc. Lond. xiii. 1821, p. 146 : Java.

A southern form, only found in the southernmost parts of Siam. Specimens obtained at Bangnara and Paknam Chumpon.

Tephrodornis pondicerianus Gm.

Muscicapa pondiceriana Gmelin, Syst. Nat. i. 1788, p. 939 : Coromandel coast.

Recorded from northern Siam, where specimens have been collected at Koon Tan and in the neighbourhood of Muang Pré.

Tephrodornis pelvicus Hodgs.

Tentheca pelvica Hodgson, Ind. Rev. i. 1837, p. 447 : Nepal.

Fairly common in suitable localities throughout northern Siam, extending southwards at least to the latitude of Koh Lak, where typical specimens have been obtained.

Tephrodornis gularis Raffl.

Lanius gularis Raffles, Trans. Linn. Soc. Lond. xiii. 1822, p. 304 : Sumatra.

Inhabits the southern parts of peninsular Siam. Specimens recorded from Kao Nawng, Ban Kok Klap, and from the island of Puket.

Family ARTAMIDÆ.

Artamus fuscus Vieill.

Artamus fuscus Vieillot, Nouv. Dict. d'Hist. Nat. xvii. 1817, p. 297 : "Bengale."

Apparently distributed throughout the whole country.

Family SYLVIIDÆ.

Locustella certhiola Pall.

Motacilla certhiola Pallas, Zoogr. Rosso-Asiat. i. 1827, p. 509 : Baical.

A winter visitor to Siam, hitherto only met with at Bangkok.

Locustella lanceolata Temm.

Sylvia lanceolata Temminck, Man. d'Orn. Ed. ii., iv. 1840, p. 614 : "Russia."

Recorded from northern Siam and Trang. Winter visitor only.

Acrocephalus arundinaceus orientalis Temm. & Schleg.

Salicaria turdina orientalis Temminck & Schlegel in Siebold's Fauna Japon., Aves, 1847, p. 50, pl. 20 B : Japan, Borneo, Makassar, and Sumatra.

Obtained during the winter time at Bangkok and on the island of Puket.

Acrocephalus bistrigiceps Swinh.

Acrocephalus bistrigiceps Swinhoe, Ibis, 1860, p. 51 : Amoy.

Recorded from Bangkok, from Klong Yai in south-eastern Siam, and from the island of Koh Pennan off the eastern coast of the peninsula.

Sutoria sutoria phyllorrapheus Swinh.

Orthotomus phyllorrapheus Swinhoe, Ibis, 1860, p. 49 : Amoy, China.

The Tailor-birds found in Siam belong to the race described by Swinhoe from China. This form is distinguished from the typical race found in India by its smaller size. Occurs throughout Siam southwards at least to Koh Lak, but southern limits of range not yet ascertained.

Sutoria sutoria maculicollis Moore.

Orthotomus maculicollis Moore, P. Z. S. Lond. 1854, p. 309: Malacca.

The Malayan race of the Tailor-bird has hitherto only been met with in peninsular Siam, where specimens have been obtained at Lamra (Trang) and Menam Kabren.

Orthotomus ruficeps Less.

Edela ruficeps Lesson, Traité d'Orn. 1831, p. 309: "Côte Nord-ouest Nouv. Hollande."

A southern form recorded as being very rare in Trang. Otherwise it has been collected at Maprit and at Ban Kok Klap in Bandon Province.

Orthotomus atrogularis atrogularis Temm.

Orthotomus atrogularis Temminck, Texte des Planches Col. livr. 101, 1836: Malacca.

Recorded from several localities in peninsular Siam and from the neighbouring islands.

Orthotomus atrogularis nitidus Hume.

Orthotomus nitidus Hume, Stray Feathers, ii. 1874, p. 478: N. Tenasserim.

Authentic specimens of this race have only been recorded from eastern Siam, where it has been collected at Lat Bua Kao, Muang Pa Tong Tschai, and Sakerat.

Cisticola exilis exilis Vig. & Horsf.

Malurus exilis Vigors & Horsfield, Trans. Linn. Soc. Lond. xv 1827, p. 223: New South Wales, Australia.

Hitherto only found at Bangkok and in its neighbourhood.

Cisticola cisticola cursitans Frankl.

Prinia cursitans Franklin, P. Z. S. Lond. 1831, p. 118: Hindostan.

Found by Williamson and Herbert at Bangkok and in its neighbourhood.

Franklinia rufescens beavani Wald.

Prinia beavani Walden, P. Z. S. Lond. 1866, p. 551: Scouaygoon, Burma.

This race has been found in eastern, northern, and peninsular Siam. Specimens recorded from Lat Bua Kao, Pak Pan, Koon Tan, Sop Tue, and Tap-tien.

Franklinia rufescens poliocephala Anders.

Prinia poliocephala Anderson, P. Z. S. Lond. 1878, p. 370, pl. xix.: Kumaon.

Originally described from Kumaon, but met with at Koon Tan in northern Siam by the present author.

Megalurus palustris Horsf.

Megalurus palustris Horsfield, Trans. Linn. Soc. Lond. xiii. 1821, p. 159: Java.

Apparently breeding in central Siam, where specimens have been collected at Paknampo, Samkok, and Bangkok.

Graminicola bengalensis striata Styan.

Graminicola striata Styan, Bull. Brit. Ornith. Club, i. 1892, p. vi: Hainan.

According to Oates (Fauna Brit. India, i. 1889, p. 382) there is a specimen in the British Museum (Nat. Hist.) labelled "Siam." The bird has also recently been obtained by Herbert at Samkok in central Siam.

Arundinax aëdon Pall.

Muscicapa aëdon Pallas, Reise Russ. Reichs, iii. 1776, p. 695: Dauria.

A winter visitor to Siam, where it has been found on several occasions.

Phylloscopus lugubris Blyth.

Phylloscopus lugubris Blyth, Ann. & Mag. Nat. Hist. (1) xii. 1843, p. 98: Calcutta.

Hitherto only obtained at Lat Bua Kao in eastern Siam.

Phylloscopus tenellipes Swinh.

Phylloscopus tenellipes Swinhoe, Ibis, 1860, p. 53: Amoy, China.

Obtained on several occasions in different parts of Siam during the winter months.

Phylloscopus borealis borealis Blas.

Phyllopneuste borealis Blasius, Naumannia, 1858, p. 313: Ochotskan Sea.

Appears to be common during the winter months.

Phylloscopus borealis xanthodryas Swinh.

Phylloscopus xanthodryas Swinhoe, P. Z. S. Lond. 1863, p. 296: Amoy, China.

Recorded from Kao Song, Lat Bua Kao, Koh Lak, and from Koh Pennan and Pulu Butang.

Phylloscopus occipitalis coronata Temm. & Schleg.

Ficedula coronata Temminck & Schlegel in Siebold's Fauna Japon., Aves, 1847, p. 48, pl. 18: Japan.

Obtained at Lat Bua Kao, Koh Lak, and Tung Song, as well as on Puket.

Phylloscopus nitidus plumbeitarsus Swinh.

Phylloscopus plumbeitarsus Swinhoe, Ibis, 1861, p. 300: between Taku and Peking.

Recorded from Koh Lak, Den Chal, and Non Luum.

Phylloscopus superciliosa superciliosa Gm.

Motacilla superciliosa Gmelin, Syst. Nat. i. 1788, p. 975: "Russia."

Fairly common during the winter months throughout the whole country.

Phylloscopus fuscata fuscata Blyth.

Phyllopneuste fuscata Blyth, Journ. Asiat. Soc. Bengal, xi. 1842, p. 113: Calcutta.

A winter visitor to Siam, where it has been found at Bangkok, Lat Bua Kao, Koon Tan, and Sop Tue.

Phylloscopus proregulus Pall.

Motacilla proregulus Pallas, Zoogr. Rosso-Asiat. i. 1827, p. 499: Ingodo river, Dauria.

Not obtained by any recent collector in Siam, but stated by Gould (P. Z. S. Lond. 1859, p. 151) to be found there on the strength of specimens collected by Sir R. Schomburgk.

Urosphena squameiceps Swinh.

Tribura squameiceps Swinhoe, P. Z. S. Lond. 1863, p. 292: Canton, China.

Herbert obtained a single male specimen at Maprit, peninsular Siam.

Burnesia flaviventris Deless.

Orthotomus flaviventris Delessert, Rev. Zool. 1840, p. 101: Bhotan.

Hitherto only recorded from Muok Lek, a station on the Bangkok-Korat railway-line.

Prinia inornata herberti Stuart Baker.

Prinia inornata herberti Stuart Baker, Bull. Brit. Ornith. Club, xxxviii. 1918, p. 39: Bangkok ♂, Samkok ♀.

Besides the type-localities this interesting form has been recorded from Lat Bua Kao in eastern Siam.

Family TURDIDÆ.

Pratincola caprata bicolor Sykes.

Saxicola bicolor Sykes, P. Z. S. Lond. 1832, p. 92: "Deccan."

Quite common in northern Siam, but hitherto not obtained in any other part of the country.

Pratincola torquata stejnegeri Parrot.

Pratincola rubicola stejnegeri Parrot, Verh. Ornith. Ges. in Bayern, viii. 1908, p. 124: N. Japan.

Recorded from several parts of Siam during the winter months.

Pratincola torquata przewalskii Pleske.

Pratincola maura var. *przewalski* Pleske, Wiss. Res. Przewalski, Reisen, Vögel, i. 1889, p. 46: Gansu.

Some specimens collected by Herbert at Menam Kabren, Maprit, and Samkok are provisionally placed under this name by Mr. E. C. Stuart Baker.

Oreicola ferrea haringtoni Hart.

Oreicola ferrea haringtoni Hartert, Vögel der paläarkt. Fauna, Bd. i. 1910, p. 711: Fu-tschau, China.

Originally described from China, but also obtained at Koon Tan in northern Siam, where it, however, seems to be rare.

Enicurus schistaceus Hodgs.

Enicurus schistaceus Hodgson, Asiat. Res. xix. 1836, p. 189: Nepal.

Only met with in northern Siam, where specimens have been collected at Koon Tan and Doi Par Sakeng.

Enicurus leschenaulti indicus Hart.

Enicurus leschenaulti indicus Hartert, Vögel der paläarkt. Fauna, Bd. i. 1910, p. 760: Upper Assam.

Recorded from northern and north-western Siam, where specimens have been collected at Koon Tan and Doi Par Sakeng.

Hydrocichla frontalis Blyth.

Enicurus frontalis Blyth, Journ. Asiat. Soc. Bengal, xvi. 1847, p. 156: Malacca.

A southern form hitherto only obtained in peninsular Siam.

Hydrocichla ruficapilla Temm.

Enicurus ruficapillus Temminck, Planches Col. Nr. 534, 1831: Palembang.

Specimens recorded from Tung Song and from Kao Nawng (Bandon).

Calliope calliope Pall.

Motacilla calliope Pallas, Reise Russ. Reichs, iii. 1776, p. 697: Siberia.

A winter visitor to Siam, where it has been obtained at Bangkok.

Larvivora cyanea Pall.

Motacilla cyanea Pallas, Reise Russ. Reichs, iii. 1776, p. 697: Dauria.

Apparently not uncommon during the winter months.

Luscinia svecica subsp.?

Williamson has recently met with the Blue-throat in the neighbourhood of Bangkok. He records it under the name of *Cyanecula suecica* Linn., but it most probably is not that form but one of the other subspecies, viz., *Luscinia svecica pallidogularis* Sar., or *L. svecica robusta* Butl., which winters in India.

Kittacincla macrura tricolor Vieill.

Turdus tricolor Vieillot, Nouv. Dict. d'Hist. Nat. xx. 1818, p. 291: India.

The Indian Shama is very common throughout Siam. The Siamese birds most certainly belong to the same form that inhabits the Indian continent and not to the typical form, originally described from Pulu Condor.

Copsychus saularis saularis Linn.

Gracula saularis Linnæus, Syst. Nat. Ed. x. 1758, p. 109: Bengal.

Northern and perhaps central and eastern Siam are inhabited by the typical race of the Magpie-Robin, which is very common everywhere.

Copsychus saularis musicus Raffl.

Lanius musicus Raffles, Trans. Linn. Soc. Lond. xiii. 1820, p. 147: Sumatra.

Peninsular and southern Siam, where it is quite common.

Turdus obscurus Gm.

Turdus obscurus Gmelin, Syst. Nat. i. (2), 1789, p. 816: Baical.

A winter visitor to peninsular Siam, whence it has been recorded several times.

Turdus aureus angustirostris Gyldenst.

Turdus aureus angustirostris Gyldenstolpe, Ornith. Monatsber. 1916, p. 28: Koon Tan, N. Siam.

Hitherto only known from Koon Tan, where a few specimens have been collected.

Turdus horsfieldi affinis Richm.

Oreocichla horsfieldi affinis Richmond, Proc. Biol. Soc. Wash. xv. 1902, p. 158 : Trang, peninsular Siam.

Up to the present time only known from the type specimen.

Geocichla citrina citrina Lath.

Turdus citrinus Latham, Ind. Ornith. i. 1790, p. 350 : India.

Recorded from several localities in peninsular Siam and from some of the neighbouring islands, such as Pulu Terutau and Pulu Lontar.

Geocichla citrina innotata Blyth.

Geocichla innotata Blyth, Journ. Asiat. Soc. Bengal, xv. 1846, p. 370 : Malay Peninsula.

This form, if really distinct from the last-named, has been recorded from Trang in peninsular Siam, from the island Koh Kut and from Koh Tan in northern Siam.

Monticola solitaria philippensis Müll.

Turdus philippensis, P. L. S. Müller, Natursystem, Anhang, 1776, p. 142.

A winter visitor to Siam, where it seems to be quite common.

Monticola solitaria pandoo Sykes.

Petrocincla pandoo Sykes, P. Z. S. Lond. 1832, p. 87 : Ghats, India.

Winters in Siam, where it is fairly abundant.

Monticola gularis, Swinh.

Orœcetes gularis Swinhoe, P. Z. S. Lond. 1862, p. 318 : Peking.

A very rare winter visitor to Siam, whence it has only been recorded twice, viz., from Koon Tan in northern Siam and from Klong Menao in the south-east.

Zoothera marginata Blyth.

Zoothera marginata Blyth, Journ. Asiat. Soc. Bengal, xvi. 1847, p. 141 : Arakan.

Recorded from Klong Yai in south-western Siam, and in the British Museum there is a specimen labelled " Siam."

Family LIOTRICHIDÆ.

Mesia argentauris Hodgs.

Mesia argentauris Hodgson, Ind. Rev. 1838, p. 88: Nepal.

The Silver-eared Mesia has only been recorded from Kao Nawng in the province of Bandon, peninsular Siam.

Pteruthius æralatus æralatus Tick.

Pteruthius æralatus Tickell, Journ. Asiat. Soc. Bengal, xxiv. 1855, p. 267: Tenasserim.

Rather rare in Siam, where it, however, has been recorded from Kao Nawng, Koon Tan, Doi Nga Chang, and Muang Wang.

Family SIBIIDÆ.

Herpornis xantholeuca tyrannulus Swinh.

Herpornis tyrannulus Swinhoe, Ibis, 1870, p. 347: Central Hainan.

The specimens collected in northern and eastern Siam seem to be nearest to the Hainan form. Birds from peninsular Siam south of the latitude of Koh Lak most certainly belong to the Malayan form recently separated by Hartert under the name of *Herpornis xantholeuca interposita.*

Family BRACHYPTERYGIDÆ.

Myiophoneus temminckii Vig.

Myiophoneus temminckii Vigors, P. Z. S. Lond. 1831, p. 171: Himalayas.

Obtained at Koon Tan in northern Siam.

Myiophoneus cæruleus Scop.

Gracula cærulea Scopoli, Del. Floræ et Faunæ Insubr. ii. 1786, p. 88: China.

Apparently very rare in Siam, where a single specimen has been obtained at Koon Tan by the present author.

Myiophoneus eugenei eugenei Hume.

Myiophoneus eugenei Hume, Stray Feathers, i. 1873, p. 475: Thayetmyo.

Not uncommon in Siam, where it has been obtained in different localities.

Myiophoneus eugenei crassirostris Rob.

Myiophoneus crassirostris Robinson, Bull. Brit. Ornith. Club, xxv. 1910, p. 99: Trang, peninsular Siam.

Besides being found at Trang this form has been collected on Pulu, Terutau, Pulu Lontar, and Koh Muk.

Myiophoneus eugenei klossi Rob.

Myiophoneus klossi Robinson, Ibis, 1915, p. 750: Koh Mehsi West I., S.E. Siam.

Only known from the type locality, where a single male was obtained.

Brachypteryx wrayi Grant.

Brachypteryx wrayi Grant, Bull. Brit. Ornith. Club, xix. 1906, p. 10: Gunong Batu Pateh.

In Siam this species has only been met with at Kao Nawng in the province of Bandon.

Family Timeliidæ.

Gampsorhynchus rufulus torquatus Hume.

Gampsorhynchus torquatus Hume, Proc. Asiat. Soc. Bengal, 1874, p. 107: Burma.

The Ring-necked Shrike-Babbler appears to be rare and locally distributed in Siam, and has up to the present time only been met with in the neighbourhood of Koon Tan.

Pyctoris sinensis sinensis Gm.

Parus sinensis Gmelin, Syst. Nat. i. 1788, p. 1012: China.

Mentioned by Blanford (Fauna of British India, i. 1889, p. 138) and by Sharpe (Cat. Birds Brit. Mus. vii. 1883, p. 511) as ranging into Siam, but never met with there by any recent collector.

Timelia pileata jerdoni Wald.

Timelia jerdoni Walden, Ann. & Mag. Nat. Hist. (4) x. 1872, p. 61: Khasia Hills.

Authentic specimens of Jerdon's Red-capped Babbler have quite recently been recorded from Chienghai, Sriracha, Nong Kae, and Angthong.

Pellorneum ruficeps subochraceum Swinh.

Pellorneum subochraceum Swinhoe, Ann. & Mag. Nat. Hist. (4) vii. 1871, p. 259 : Tenasserim.

Commonly distributed throughout the whole country.

Pellorneum ruficeps minus Hume.

Pellorneum minus Hume, Stray Feathers, i. 1873, p. 298 : Thayetmyo.

This Spotted Babbler has hitherto only been found on the island of Puket.

Drymocataphus tickelli tickelli Blyth.

Pellorneum tickelli Blyth, Journ. Asiat. Soc. Bengal, xxviii. 1859, p. 414 : Tenasserim.

Obtained in northern as well as peninsular Siam, but apparently not common, as specimens have only been recorded from Trang, Kao Nawng, and Pak Koh.

Drymocataphus nigricapitatus Eyton.

Brachypteryx nigricapitata Eyton, P. Z. S. Lond. 1839, p. 103 : Malacca.

A southern form recorded as being rare in Trang. Elsewhere obtained at Ban Kok Klap in the province of Bandon.

Gypsophila crispifrons Blyth.

Turdinus crispifrons Blyth, Journ. Asiat. Soc. Bengal, xxiv. 1855, p. 269 : Tenasserim.

Extremely rare in Siam, whence it has only been recorded once, when it was obtained at Muang Song in northern Siam.

Malacocincla sepiaria abbotti Blyth.

Malacocincla abbotti Blyth, Trans. Asiat. Soc. Bengal, xiv. 1845, p. 601 : Ramree Island, Arakan.

Found throughout northern, central, and eastern Siam, being replaced in the south by other allied forms.

Malacocincla sepiaria olivaceum Strickl.

Malacopteron olivaceum Strickland, Ann. & Mag. Nat. Hist. (1) xix. 1847, p. 132 : Malacca.

Recorded from Kao Nawng Samui by Robinson.

Malacocincla sepiaria tardinata Hart.

Malacocincla sepiaria tardinata Hartert, Bull. Brit. Ornith. Club, xxxvi. 1916, p. 35: Gunong Tahan.

This newly described form has been recorded from Bangnara in peninsular Siam.

Malacocincla macrodactyla Strickl.

Malacopteron macrodactylum Strickland, Ann. & Mag. Nat. Hist. (1) xiii. 1844, p. 417: Malacca.

Up to the present time only recorded from Trang and Tung Song.

Malacocincla magnirostris Moore.

Alcippe magnirostris Moore, P. Z. S. Lond. 1854, p. 277: Malacca.

A southern form obtained at Bandon, Bukit Besar, Nawngchik, and Kao Nawng.

Alcippe nepalensis cinerea Blyth.

Alcippe cinerea Blyth, Journ. Asiat. Soc. Bengal, xiii. 1844, p. 384: Singapore.

Rare in Trang. Otherwise recorded from Kao Nawng, Nawngchik, and Bukit Besar.

Alcippe phæocephala magnirostris Wald.

Alcippe magnirostris Walden in Blyth's Birds of Burma, 1875, p. 115: Karen Hills.

Somewhat rare in northern Siam, where specimens have been collected at Kao Plyng and Doi Par Sakeng. Also obtained at Kao Nawng and Trang in peninsular Siam.

Siva cyanuroptera sordidior Sharpe.

Siva sordidior Sharpe, P. Z. S. Lond. 1888, p. 276: Perak.

Only obtained at present at Kao Nawng in peninsular Siam.

Stachyrhidopsis rufifrons rufifrons Hume.

Stachyrhidopsis rufifrons Hume, Stray Feathers, iii. 1873, p. 479: Pegu.

Obtained in northern and north-western Siam. Locally distributed and apparently rather rare.

Stachyrhidopsis rufifrons obscura Stuart Baker.

Stachyrhidopsis rufifrons obscura Stuart Baker, Bull. Brit. Ornith. Club, xxxviii. 1917, p. 10 : Klong Bang Lai, peninsular Siam.

Hitherto only recorded from peninsular Siam, where it seems to be rare.

Cyanoderma erythropterum erythropterum Blyth.

Timalia erythroptera Blyth, Journ. Asiat. Soc. Bengal, xi. 1842, p. 794 : Malacca.

Fairly rare in peninsular Siam, where specimens have been recorded from Trang, Ban Kok Klap, Klong Wang Hip, Maprit, and Kupet. Stuart Baker has recently (Bull. Brit. Ornith. Club, xxxviii. 1917, p. 10) created a new subspecies (*Cyanoderma erythropterum sordida*) on specimens from Klong Wang Hip and Maprit, but Robinson & Kloss only consider this race as typical *C. e. erythropterum* Blyth.

Thringorhina guttata Tick.

Turdinus guttatus Tickell, Journ. Asiat. Soc. Bengal, xxviii. 1859, p. 414 : Tenasserim.

Occurs in peninsular Siam, where specimens have been collected at Kao Nawng and Trang.

Stachyrhis nigricollis Temm.

Timalia nigricollis Temminck, Planches Col. Nr. 594, fig. 2, 1836 : Borneo.

Recorded as being rare in Trang and otherwise only obtained at Bangnara in peninsular Siam.

Stachyrhis poliocephala Temm.

Timalia poliocephala Temminck, Planches Col. Nr. 593, fig. 2, 1836 : Sumatra.

Hitherto only recorded from Trang, where it is stated to be rare.

Stachyrhis chrysea chrysops Richm.

Stachyrhis chrysops Richmond, Proc. Biol. Soc. Wash. xv. 1902, p. 157 : Trang, peninsular Siam.

Besides the type locality this form has only been recorded from Kao Nawng, in the province of Bandon, peninsular Siam.

Stachyrhis nigriceps davisoni Sharpe.

Stachyrhis davisoni Sharpe, Bull. Brit. Ornith. Club, i. 1892, p. 7 : Pahang.

Obtained in northern and peninsular Siam, though apparently not common.

Mixornis sumatrana pileata Blyth.

Prinia pileata Blyth, Journ. Asiat. Soc. Bengal, xi. pt. 1, 1842, p. 204 : Malay Peninsula.

A southern form, hitherto only met with in Siam at Patani.

Mixornis sumatrana connectens Kloss.

Mixornis rubricapilla connectens Kloss, Ibis, 1918, p. 207 : Lat. 10° N.

Inhabits peninsular Siam north of the area occupied by the last-named race. It apparently extends into central Siam at least as far north as Bangkok. It has also been met with in the neighbourhood of Cape Liant in south-eastern Siam.

Mixornis sumatrana minor Gyld.

Mixornis sumatrana minor Gyldenstolpe, Kongl. Sv. Vetenskapsakad. Handl. Bd. 56, Nr. 2, 1916, p. 60 : Pak Koh, N. Siam.

Very common throughout northern and eastern Siam. It probably also inhabits the northern parts of central Siam, though its southern limits of range have not yet been ascertained.

Anuropsis malaccensis Hartl.

Brachypteryx malaccensis Hartlaub, Rev. Zool. 1844, p. 402 : Malacca.

Up to the present time only recorded from Trang, Tung Song, and Mata Mansau, localities situated in peninsular Siam.

Corythocichla brevicaudata brevicaudata Blyth.

Turdinus brevicaudatus Blyth, Journ. Asiat. Soc. Bengal, xxiv. 1855, p. 272 : Mooleyit, Tenasserim.

In Siam this species has only been met with at Doi Par Sakeng, where it was very rare, only occurring on the highest mountains..

Corythocichla brevicaudata leucosticta Sharpe.

Corythocichla leucosticta Sharpe, P. Z. S. Lond. 1887, p. 438 : Mts. of Perak.

Found in peninsular Siam, where specimens have been collected at Trang, Kao Nawng, and Ban Kok Klap. The form recently described by Stuart Baker under the name of *C. brevicaudata herberti* (Bull. Brit. Ornith. Club, xxxviii. 1917, p. 10. Type locality: Tung Song) is not valid.

Turdinulus epilepidotus granti Richm.

Turdinulus granti Richmond, Proc. U.S. Nat. Mus. 1900, p. 320: Khao Sai Dow, Trang, peninsular Siam.

Obtained at Trang, and recently by Herbert at Tung Song.

Turdinulus epilepidotus bakeri Haringt.

Turdinulus bakeri Harington, Bull. Brit. Ornith. Club, xxxiii. 1913, p. 44 : S. Shan States.

Originally described from the southern Shan States but recently recorded from Muang Wang in northern Siam.

Setaria rufifrons Cab.

Malacopterum rufifrons Cabanis, Mus. Hein. i. 1850, p. 65 : Sumatra.

Recorded from Pak Jong in eastern and from Klong Menao, Lat Bua Kao, and Satahip in south-eastern Siam.

Setaria magna magna Eyton.

Malacopterum magnum Eyton, P. Z. S. Lond. 1839, p. 103 : Sumatra.

Up to the present time only found at Bangnara in peninsular Siam.

Setaria magna cinerea Eyton.

Malacopteron cinereum Eyton, P. Z. S. Lond. 1839, p. 103: Malacca.

Like the last species this bird has only been recorded from Bangnara.

Kenopia striata Blyth.

Timalia striata Blyth, Journ. Asiat. Bengal, xi. 1842, p. 793: Malay Peninsula.

Inhabits peninsular Siam, where specimens have been collected at Trang.

Erythrocichla bicolor Less.

Brachypteryx bicolor Lesson, Rev. Zool. 1839, p. 138: Sumatra.

Met with in peninsular Siam.

Macrounus ptilosus Jard. & Selby.

Macrounus ptilosus Jardine & Selby, Ill. Orn. 1835, pl. 150: Malacca.

Recently obtained and recorded from Bangnara in peninsular Siam.

Family CRATEROPODIDÆ.

Dryonastes chinensis Scop.

Lanius chinensis Scopoli, Del. Floræ et Faunæ Insubr. ii. 1786, p. 86: China.

Somewhat rare in northern Siam, where specimens have been collected at Koon Tan and Chienghai. Mentioned by Gairdner from the provinces of Ratburi and Petchaburi.

Dryonastes perspicillatus Gm.

Turdus perspicillatus Gmelin, Syst. Nat. i. 1789, p. 830: China.

In the British Museum (Natural History) there is a specimen from the Finlayson collection said to have been obtained in Siam. Not found by any recent collector.

Garrulax leucolophus diardi Less.

Turdus diardi Lesson, Traité d'Orn. 1831, p. 408: Cochin China.

One of the most common birds in the whole of Siam.

Garrulax pectoralis Gould.

Ianthocincla pectoralis Gould, P. Z. S. Lond. 1835, p. 186: Nepal.

Commonly distributed throughout northern Siam.

Garrulax albogularis Gould.

Ianthocincla albogularis Gould, P. Z. S. Lond. 1835, p. 187: Nepal.

In the Proceedings of the Zoological Society of London, 1859, p. 151, this bird is recorded from Siam on the strength of specimens collected by Sir R. Schomburgk. It has, however, never been met with by any recent collectors, and Gould's identification was most probably wrong.

Garrulax moniliger fuscata Stuart Baker.

Garrulax moniliger fuscata Stuart Baker, Bull. Brit. Ornith. Club, xxxviii. 1918, p. 64.

Quite common throughout the northern parts of Siam. This race has rufous tips to the tail-feathers while the ear-coverts are almost wholly white. Southern limits of range not properly ascertained.

Garrulax moniliger mouhoti Sharpe.

Garrulax mouhoti Sharpe, Cat. Birds Brit. Mus. vii. 1883, p. 444: Cambodia.

Authentic specimens of this rare bird have been collected in eastern Siam, at Lat Bua Kao, Pak Jong, and Chan Tuek. Otherwise it has been recorded from Koh Bon and Menam Kabren.

Garrulax strepitans Tick.

Garrulax strepitans Tickell, Journ. Asiat. Soc. Bengal, xxiv. 1855, p. 268: Mooleyit, Tenasserim.

Occurs in northern and south-western Siam, though it seems to be rather rare, specimens having only been collected at Koon Tan and Si-sa-wad.

Trochalopterum melanostigma peninsulæ Sharpe.

Trochalopterum peninsulæ Sharpe, P. Z. S. Lond. 1887, p. 436: Mts. of Perak.

Hitherto only found within Siamese territory at Kao Nawng in the province of Bandon.

Pomatorhinus olivaceus ripponi Haringt.

Pomatorhinus ripponi Harington, Bull. Brit. Ornith. Club, xxvii. 1910, p. 9: Shan States.

Recently recorded from northern Siam, where specimens have been obtained at Doi Nga Chang and at Muang Wang.

Pomatorhinus olivaceus fastidiosus Hart.

Pomatorhinus schisticeps fastidiosus Hartert, Bull. Brit. Ornith. Club, xxxvi. 1916, p. 81: Ko-khau, Trang, peninsular Siam.

Originally described from Trang, but also obtained at Kao Nawng.

Pomatorhinus olivaceus siamensis Stuart Baker.

Pomatorhinus olivaceus siamensis Stuart Baker, Bull. Brit. Ornith. Club, xxxviii. 1917, p. 9: Maprit, peninsular Siam.

Birds from Maprit and Klong Bang Lai have recently been separated by Stuart Baker under the above-mentioned name, but according to Robinson & Kloss (Ibis, 1918, p. 589) they are probably only *P. o. fastidiosus* Hart. This statement is, however, denied by Stuart Baker in another paper (*vide* Ibis, 1918, p. 594).

Pomatorhinus nuchalis klossi Stuart Baker.

Pomatorhinus nuchalis klossi Stuart Baker, Bull. Brit. Ornith. Club, xxxviii. 1917, p. 9: Klong Menao ♂, Samkok ♀.

Apparently confined to south-eastern and central Siam.

Pomatorhinus ochraceiceps ochraceiceps Wald.

Pomatorhinus ochraceiceps Walden, Ann. & Mag. Nat. Hist. (4) xii. 1873, p. 487: Karennee.

Found in northern Siam, where specimens have been collected at Koon Tan and Muang Wang.

Pomatorhinus hypoleucus tickelli Blyth.

Pomatorhinus hypoleucus var., Blyth, Journ. Asiat. Soc. Bengal, xxiv. 1855, p. 273: Mooleyit, Tenasserim;—cf. *Pomatorhinus* (*Orthorhinus*) *tickelli* Hume, Stray Feathers, v. 1877, p. 32.

Hitherto only recorded from Koon Tan in northern Siam, where it, however, is not uncommon.

Eupetes macrocercus griseiventris Stuart Baker.

Eupetes macrocercus griseiventris Stuart Baker, Bull. Brit. Ornith. Club, xxxviii. 1917, p. 8: Tung Song, peninsular Siam.

Found at Tung Song in the province of Nakern Sritamarat, peninsular Siam, and at Kao Nawng in the province of Bandon.

Family PYCNONOTIDÆ.

Ægithina tiphia tiphia Linn.

Motacilla tiphia Linnæus, Syst. Nat. Ed. x. 1758, p. 186: Bengal.

Fairly common throughout Siam, occurring southwards at least as far as Bandon.

Ægithina tiphia viridissima Bp.

Iora viridissima Bonaparte, Consp. Gen. Av. i. 1850, p. 397: Borneo.

A southern form. Authentic specimens have been collected at Koh Lak, in Trang, and on the island of Terutau. Northern limits of range still not definitely ascertained.

Æthorhynchus lafresnayei lafresnayei Hartl.

Iora lafresnayei Hartlaub, Rev. Zool. 1844, p. 401: Malay Peninsula.

Distributed throughout peninsular, eastern, south-eastern, and northern Siam.

Chloropsis aurifrons aurifrons Temm.

Phyllornis aurifrons Temminck, Planches Col. Nr. 484, fig. 1, 1829: "India."

The typical race of the Golden-fronted Chloropsis is rather abundant in northern Siam. It has also been recorded from the central parts of the country, though it seems to be less common there.

Chloropsis aurifrons inornatus Kloss.

Chloropsis aurifrons inornatus Kloss, Ibis, 1918, p .198: Lat Bua Kao, E. Siam.

Originally described from Lat Bua Kao, but specimens identified as belonging to this race have also been mentioned from Koh Lak in south-western Siam.

Chloropsis hardwickii hardwickii Jard. & Selby.

Chloropsis hardwickii Jardine & Selby, Ill. Orn. ii. Appendix, p. 1: "Nepaul."

Only met with, and recorded by the present author, at Koon Tan in northern Siam. Apparently very rare, as only one specimen has ever been procured.

Chloropsis chlorocephala chlorocephala Wald.

Phyllornis chlorocephala Walden, Ann. & Mag. Nat. Hist. (4) vii. 1871, p. 241: Tonghoo, Burma.

Apparently distributed throughout the whole country.

Chloropsis zosterops Vig.

Chloropsis zosterops Vigors, App. Mem. Life Raffles, 1830, p. 674: Sumatra.

A southern form recorded from Chong (Trang), Bukit Besar, and Nawngchik. Also found on the islands Pulu Telibun, Pulu Lontar, and Puket.

Chloropsis icterocephala Less.

Phyllornis icterocephalus Lesson, Rev. Zool. 1840, p. 164: Sumatra.

Hitherto only found within Siamese territory on the island of Puket.

Chloropsis cyanopogon Temm.

Phyllornis cyanopogon Temminck, Planches Col. Nr. 512, 1823: Palembang, Sumatra.

Inhabits the most southern parts of peninsular Siam, specimens having been obtained in Trang and at Mabek and Jalor.

Hypsipetes concolor yunnanensis Anders.

Hypsipetes yunnanensis Anderson, P. Z. S. Lond. 1871, p. 213 : Ponsee, Kakhyen Hills.

Hitherto only met with in northern Siam, where specimens have been collected at Koon Tan.

Iole olivacea lönnbergi Gyld.

Criniger lönnbergi Gyldenstolpe, Kongl. Sv. Vetenskaps-akad. Handl. Bd. 50, Nr. 8, 1913, p. 24 : Bang Hue Hom, N. Siam.

Inhabits northern and north-western Siam, where it is quite common.

Iole olivacea cinnamomeoventris Stuart Baker.

Iole virescens cinnamomeoventris Stuart Baker, Bull. Brit. Ornith. Club, xxxviii. 1917, p. 16 : S. Tenasserim.

Peninsular Siam, where specimens have been recorded from Chong in Trang, from Koh Lak and Puket. In south-eastern Siam it has also been found at Hup Bon.

Iole tickelli peracensis Hart. & Butl.

Iole tickelli peracensis Hartert & Butler, Nov. Zool. v. 1898, p. 506 : Gunong Ijau, Perak.

Specimens identified as belonging to this race have only been collected at Kao Nawng in the province of Bandon, peninsular Siam.

Hemixus cinereus Blyth.

Iole cinerea Blyth, Journ. Asiat. Soc. Bengal, xiv. 1845, p. 573 : Malacca.

Rare in Trang. Otherwise only recorded from Bukit Besar and Nawngchik.

Hemixus malaccensis Blyth.

Hypsipetes malaccensis Blyth, Journ. Asiat. Soc. Bengal, xiv. 1845, p. 574 : Malacca.

A southern form found in peninsular Siam and the neighbouring islands.

Hemixus hildebrandi Hume.

Hemixus hildebrandi Hume, Stray Feathers, ii. 1874, p. 508: Salween, Tenasserim.

Quite recently obtained at Muang Wang in northern Siam.

Molpastes atricapillus Vieill.

Muscicapa atricapilla Vieillot, Nouv. Dict. d'Hist. Nat. xxi. 1818, p. 489: "Chine."

Commonly distributed throughout northern Siam.

Molpastes germaini Oust.

Ixus germaini Oustalet, Bull. Soc. Philom. Paris, (7) ii. 1878, p. 54: Cambodia.

Inhabits eastern Siam, but also obtained at Bangkok.

Xanthiscus flavescens vivida Stuart Baker.

Xanthiscus flavescens vivida Stuart Baker, Bull. Brit. Ornith. Club, xxxviii. 1917, p. 16: Salween ♂, Mooleyit, Tenasserim, ♀.

Of this newly described form specimens have been collected at Doi Nga Chang in northern Siam.

Otocompsa flaviventris flaviventris Tick.

Vanga flaviventris Tickell, Journ. Asiat. Soc. Bengal, ii. 1833, p. 573: Dampára.

Inhabits northern, north-western, eastern, and central Siam, being most common in the north.

Otocompsa flaviventris johnsoni Gyld.

Rubigula johnsoni Gyldenstolpe, Kongl. Sv. Vetenskaps-akad. Handl. Bd. 50, Nr. 8, 1913, p. 25: Sakerat, E. Siam.

Originally described from eastern Siam, but also obtained in the province of Nakorn Sritamarat in the peninsular parts of the country.

Otocompsa flaviventris minor Kloss.

Otocompsa flaviventris minor Kloss, Ibis, 1918, p. 200: Koh Lak, S.W. Siam.

Originally described from peninsular Siam, but it most certainly also extends into the south-eastern parts of the country.

Otocompsa emeria emeria Linn.

Motacilla emeria Linnæus, Syst. Nat. Ed. x. 1758, p. 187 : Bengal.

Abundant throughout the whole country.

Euptilosus euptilosus Jard. & Selby.

Brachypus euptilosus Jardine & Selby, Ill. Orn. iv. (new series), 1836, pl. iii. : Singapore.

Recently recorded from Bangnara in peninsular Siam.

Pycnonotus goiavier analis Horsf.

Turdus analis Horsfield, Trans. Linn. Soc. Lond. xiii. 1822, p. 147 : Java.

Quite common in peninsular Siam, extending northwards at least to Bangkok.

Pycnonotus blanfordi blanfordi Jerd.

Pycnonotus blanfordi Jerdon, Ibis, 1862, p. 20: Upper Burma.

Fairly abundant throughout Siam proper. Southwards it extends at least as far as Koh Lak, but its southern limits of range are still not ascertained.

Pycnonotus blanfordi robinsoni Grant.

Pycnonotus robinsoni Grant, Fascic. Malayenses, 1903, p. 85 : Patani.

Occurs in the southernmost parts of peninsular Siam, where specimens have been collected at Koh Lak, Ban Kok Klap, Patani, and on the island of Koh Mehsan.

Pycnonotus hainanus Swinh.

Ixus hainanus Swinhoe, Ibis, 1870, p. 253 : Hainan.

In the British Museum (Natural History) there is a specimen from Siam procured by Finlayson. However, it has never been met with by any recent collector.

Pycnonotus finlaysoni finlaysoni Strickl.

Pycnonotus finlaysoni Strickland, Ann. & Mag. Nat. Hist. (1) xiii. 1844, p. 411: Malacca.

Commonly distributed throughout the whole country.

Pycnonotus erythrophthalmos erythrophthalmos Hume.

Ixos erythrophthalmos Hume, Stray Feathers, vi. 1878, p. 314: Pakchan, S. Tenasserim.

Originally described from southern Tenasserim, but recently recorded from Bangnara in peninsular Siam.

Pycnonotus erythrophthalmos salvadorii Sharpe.

Pycnonotus salvadorii Sharpe, Cat. Birds Brit. Mus. vi. 1887, p. 401: Borneo.

Generally distributed throughout peninsular Siam.

Pycnonotus plumosus Blyth.

Pycnonotus plumosus Blyth, Journ. Asiat. Soc. Bengal, xiv. 1845, p. 567: Malacca.

Stated by Robinson & Kloss to occur in peninsular Siam. Otherwise obtained on Pulu Telibun and on Puket.

Pycnonotus simplex Less.

Pycnonotus simplex Lesson, Rev. Zool. 1839, p. 167: Sumatra.

A southern form hitherto only recorded from peninsular Siam, where specimens have been collected at Bukit Besar and Nawngchik. Also obtained on Pulu Terutau.

Rubigula webberi Hume.

Ixidia webberi Hume, Stray Feathers, viii. 1879. p. 40: Puket.

Besides the type locality this Bulbul has been recorded as being fairly common at Trang, while it has recently been obtained in Tung Song.

Criniger gutturalis ochraceus Moore.

Criniger ochraceus Moore, in Horsfield & Moore, Cat. Birds Hon. East Ind. Comp. Mus. 1854, p. 252: Tenasserim.

Generally distributed throughout Siam proper.

Criniger gutturalis sordidus Richm.

Criniger sordidus Richmond, Proc. U.S. Nat. Mus. xxii. 1900, p. 320 : Khao Sai Dow, Trang, peninsular Siam.

Found in peninsular and south-western Siam, but exact distribution still not properly ascertained.

Criniger burmanicus Oates.

Criniger burmanicus Oates, Fauna Brit. India, i. 1889, p. 256 : Burma.

Hitherto only recorded from Raheng in central Siam by Barton.

Criniger griseiceps Hume.

Criniger griseiceps Hume, Stray Feathers, i. 1873, p. 478 : Pegu.

Obtained on the island of Puket according to A. Müller.

Criniger cabanisi Müll.

Criniger cabanisi A. Müller, Journ. für Ornith. xxx. 1882, p. 384 : Puket.

Only known from the type-locality.

Criniger tephrogenys Jard. & Selby.

Trichophorus tephrogenys Jardine & Selby, Ill. Orn. 1833, pl. 127 : Malacca.

Recorded from peninsular Siam, where specimens have been collected at Bukit Besar and Nawngchik.

Criniger pallida grandis Stuart Baker.

Criniger pallida grandis Stuart Baker, Bull. Brit. Ornith. Club, xxxviii. 1917, p. 15 : Yunnan.

The Siamese birds are said by Stuart Baker to be somewhat intermediate between typical *C. p. pallida* Swinh. and the Yunnan form.

Criniger conradi Finsch.

Criniger conradi Finsch, Verh. zool.-bot. Ges. in Wien, 1873, p. 9 : Bangkok.

A very doubtful form, hitherto only known from the type specimen.

Microtarsus melanocephalus Gm.

Lanius melanocephalus Gmelin, Syst. Nat. i. 1788, p. 309 : Sumatra.

Apparently locally distributed throughout the whole country.

Trachycomus ochrocephalus Gm.

Turdus ochrocephalus Gmelin, Syst. Nat. i. 1788, p. 821 : Java.

Hitherto only recorded from Klong Wang Hip, Mabek, and Jalor in peninsular Siam.

Alophoixus phæocephalus Hartl.

Ixos (*Trichixos*) *phæocephalus* Hartlaub, Rev. Zool. 1844, p. 401 : Malacca.

In Siam this species has hitherto only been met with at Trang.

Tricholestes criniger A. Hay.

Brachypodius (?) *criniger* A. Hay, Journ. Asiat. Soc. Bengal, xiv. 1845, p. 577 : Malacca.

Recorded from Trang, where it, however, is stated to be rather rare.

Irena puella puella Lath.

Coracias puella Latham, Ind. Orn. i. 1790, p. 171 : India.

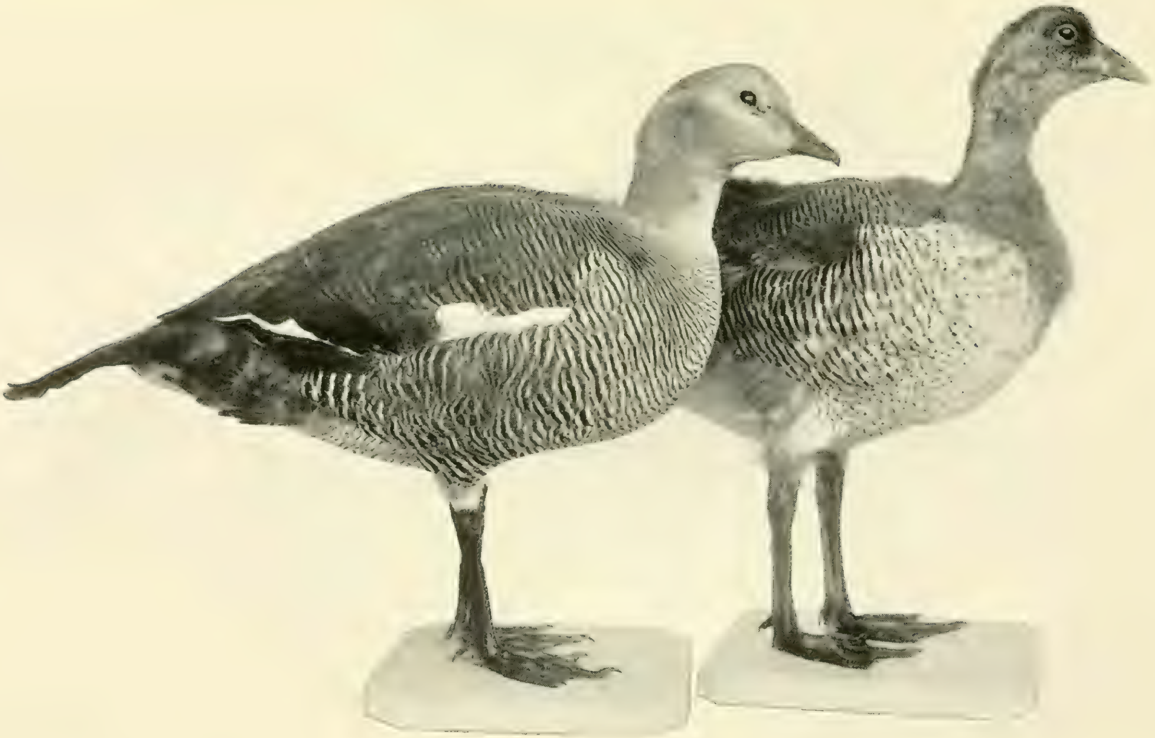
Rather common in suitable localities throughout the whole country except in the most southern parts, where it is replaced by an allied race.

Irena puella cyanea Begbie.

Irena cyanea Begbie, Mal. Peninsul. p. 516 : Malay Peninsula.

Found in the southernmost parts of peninsular Siam, specimens having been collected at Bukit Besar, Nawngchik, and on Pulu Terutau.

[To be continued.]



CHLOËPHAGA DISPAR. C. MAGELLANICA.

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XV.—*On the Type-specimen of* Chloëphaga inornata *King in the British Museum, and some further notes.* By F. E. Blaauw, C.M.Z.S., M.B.O.U.

(Plate XIII.)

I have always deplored the fact that the very appropriate name *Chloëphaga dispar* for the black-banded Goose of southern South America was altered by Salvadori in the 'Catalogue of Birds' into *C. inornata*.

Being in London in September last I took the opportunity, kindly afforded me by Mr. Chubb, of having a look at the type of *Chloëphaga inornata* of King, which is responsible for the alteration of the name of *C. dispar* into *C. inornata*. The result is that I find that this specimen of King's is *not* an individual of the South American black-banded Goose (*C. dispar*) but a *young male* of *Chloëphaga magellanica* in its first plumage and not quite full-grown. I have bred during a great many years dozens of *C. dispar* and of *C. magellanica*, and have invariably found that the young males of the black-banded Goose (*C. dispar*) are transversely banded on the under side quite as much as an adult male of this species, although the bands are not so clearly defined. The head is also much greyer.

The young males of *C. magellanica* are white on the under side with only occasional black spots, which are chiefly or most marked on the sides. The specimen of King which is responsible for the alteration of the name of *C. dispar* into *C. inornata*, is a bird which is white on the under side with a few black spots, which are chiefly on the sides. There is not the slightest doubt that this is a specimen of *C. magellanica* in its first plumage.

The wing-speculum is *not* glossy green in this specimen, but dull brownish grey, which again proves that it is a bird in its first plumage. During the first autumn of their life the geese of the genus *Chloëphaga* (and most other geese as well) moult all their feathers except the large flight-feathers, which are retained until the second moult. During the first moult they acquire the glossy green wing-speculum.

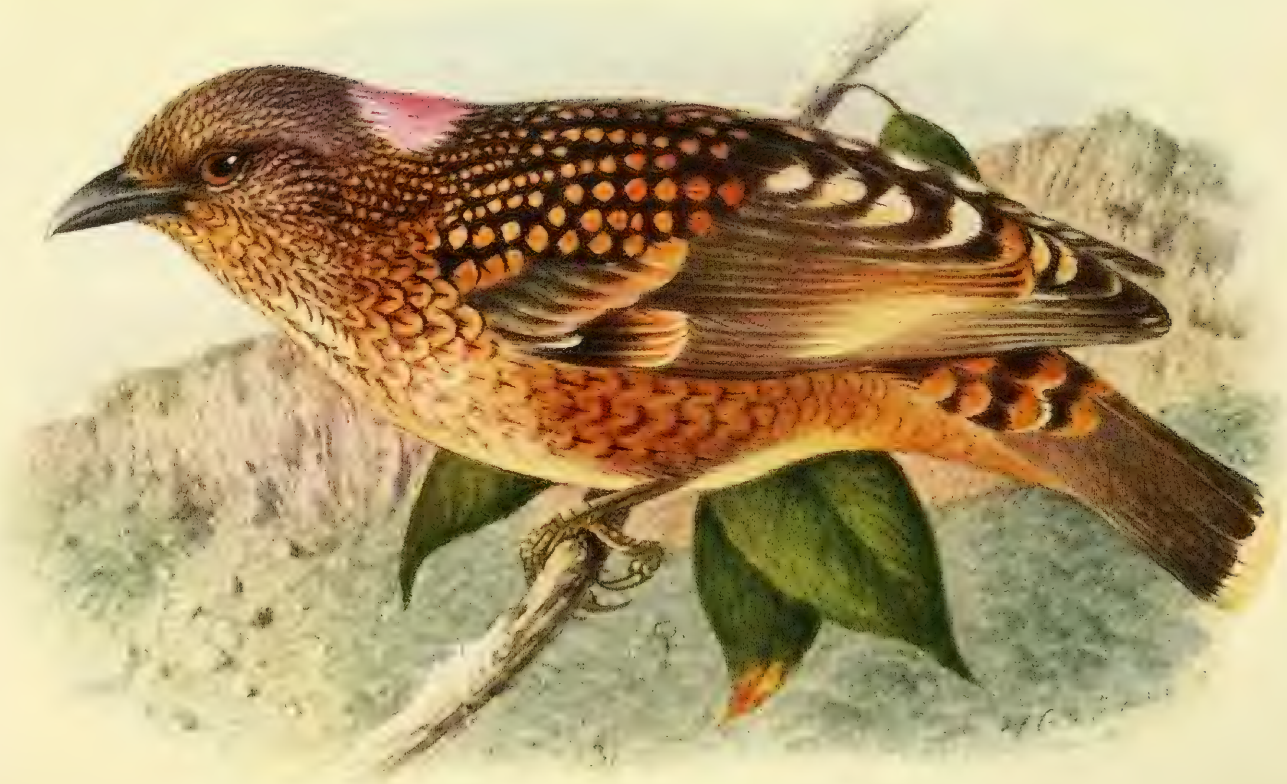
In the male *C. magellanica* the white of the under side extends itself at each successive moult, whilst the male *C. dispar* remains banded until extreme old age.

My conclusion is that the type-specimen of King being a young male of *C. magellanica* and not of *C. dispar*, the black-banded Goose ought to be again named *C. dispar*, whilst the name of *inornata* King ought to be put under the synonyms of *C. magellanica.* I show a photo of a specimen of a male *C. dispar* in its first plumage and one of a male *C. magellanica* also in its first plumage, but slightly younger, so that the grey down still adheres to the neck- and head-feathers. Both birds were bred by me and are now in the Leiden Museum.

I also examined Des Murs's descriptions of *Bernicla magellanica* and *B. inornata* in Claudio Gay's 'Historia de Chile' (fauna) on page 443. The description given there of *Bernicla magellanica* male and female agrees with what these birds look like; but the description of what he calls *Bernicla inornata* in the two sexes is applicable, as regards the *male*, to a male of *C. magellanica* with more heavily marked flanks than the bird he calls *B. magellanica*, probably a bird after the first moult. (In this description he does *not* mention the *grey* wing-coverts on which the black and white markings of the upper side are.) It certainly is *not* a male of *C. dispar*, as he says that it is *white* with black markings on the flanks, *C. dispar* having no white under side but the whole of the under side banded. The bird which he describes as a female is certainly a specimen of *C. poliocephala.* He describes the head and neck as grey, the belly as white, and on the whole gives a rather accurate description of *C. poliocephala.* Des Murs in Gay's 'Historia de Chile' has, therefore, described *two* species (*C. magellanica* Gmel. 1788, and *C. poliocephala*) as male and female under the name of *inornata*.

The name of *inornata* would therefore, I believe, have to stand for *C. poliocephala* if he had not applied this name to *two* species of birds, which makes it desirable to drop it entirely and use that of *C. poliocephala* Gr. 1844, as is usually done.

Ibis. 1920. Pl. 14.



CHLAMYDERA MACULATA NOVA.

XVI.—*On a new Species of Bower-bird.*

By T. Carter and G. M. Mathews.

(Plate XIV.)

Chlamydera maculata nova. Cape Spotted Bower-bird.

Mathews, Bull. Brit. Ornith. Club, vol. xl. p. 76 (January 30, 1920).

This fine new subspecies differs from *Chlamydera m. subguttata* (Mathews, Nov. Zool. vol. xviii. 1912, p. 410) in having the yellow on the breast and abdomen much deeper and richer in colour; the wavy flank-markings are much bolder and darker, and there is *less* black on the throat and upper chest, these parts in *Chlamydera m. subguttata* being sharply defined from the breast, which is very pale. The bill of the new subspecies is distinctly smaller, and about 5 mm. shorter.

The bird figured is a female, and had the ovaries enlarged to the size of small peas, when shot near the North-West Cape, mid-western Australia, August 9, 1916. Out of the series of six birds that were obtained there, the above has much the best coloured and largest nuchal band, which is half an inch in depth. All the birds seemed to be fully adult, and there was only one male, the nuchal band of which is very imperfect and uneven, and has about half the feathers *deep golden yellow*, the remainder being pink with a few scattered bluish-purple ones. This golden yellow does not occur in the nuchal bands of the five females.

We hope to publish a full account in the July 'Ibis' of the discovery of the above and other new subspecies, with notes and remarks on the birds seen between Albany and the North-West Cape, in the course of four trips in the intervening districts.

[If the genus *Alphachlamydera* be not admitted, the above bird can be called *Chlamydera maculata carteri*.—G. M. M.]

XVII.—*Obituary.*

We have heard with great regret of the sudden death of our fellow-member, Mr. E. Gibson, whose last paper filled much of the January number. Living as he did to a great extent in South America, he was not so much among us as most of our contributors, but his memory was kept green by a series of articles contributed to 'The Ibis' from 1879 to the present time. They all deal with the ornithology of Argentina and its neighbours; for instance, one was entitled "Ornithological Notes from Buenos Ayres," another "Notes on the Birds of Paysandu, Republic of Uruguay." Mr. Gibson was also much concerned in Sclater and Hudson's 'Argentine Ornithology,' while his work was always characterized by great thoroughness and fullness of detail. At such places as the head-station at Yngleses, within reach of the coast as well as the interior of the country, he was specially well posted for general observation of migratory or of residential birds. In fact, it will be exceptionally difficult to fill the place of so expert a field-naturalist in that district of the Southern Hemisphere. He died on October 26, 1919.

XVIII.—*Notices of recent Ornithological Publications.*

Bangs on the Jungle-Fowl and a new Hawk.

[The Name of the Common Jungle Fowl. By Outram Bangs and Thomas Edward Penard.

A new Red-shouldered Hawk from the Florida Keys. Proc. New Eng. Zool. Club, vol. vii. pp. 23–25, 35.]

In the first article the authors discuss the nomenclature of the three subspecies of *Gallus*. They conclude that *Gallus gallus* is applicable to the Bengal form, and must not be rejected.

In the second paper Mr. Bangs describes a new subspecies (*Buteo lineatus extimus*) from Florida.

Bonhote on the destruction of Migratory Birds in Egypt.

[Bird-liming in Lower Egypt. By J. Lewis Bonhote: with an Introduction by Major Flower. Cairo, 1919. Pp. i–ii, 1–9 (Ministry of Public Works, Egypt).]

In this paper the author and Major Flower inveigh against the wholesale massacre of the smaller birds on the northern Egyptian coasts, which is so prevalent at Damietta and Rosetta, though nearly stopped at Alexandria. They describe the methods of using bird-limed twigs or reeds at the spots where the flocks of migrants usually alight, and descant on the harm done by killing the species which are useful in destroying injurious insects. The Agricultural Department is doing its best to end the traffic with Europe in small birds; but it is very difficult to watch the districts involved efficiently, or to suggest effective means of prevention.

Boubier on the Migration of Birds.

[Les cinq Éventails de Migration des Oiseaux de la Faune Paléarctique. By Maurice Boubier. Geneva, 1919 (extract from Bull. Soc. Zool. Genève).]

The author, having gathered all possible information on the species of birds which migrate southwards from the palæarctic area, concludes that they move in five fan-shaped arrangements. His facts seem accurate and are carefully considered, but his deductions lose much of their value from the fact that he has omitted in his argument a great part of western South Africa, with the whole of Australia and the South Seas.

Coward on British Birds.

[The Birds of the British Isles and their Eggs. By T. A. Coward. First Series (Corvidæ to Sulidæ). London, 1919. Pp. i–vii, 1–376; 242+65 pls.]

Mr. Coward is certainly to be congratulated on this excellent little book. It is impossible to read it without feeling that the author is one who has lived among the birds in the best sense of the phrase, has visited their breeding-haunts, studied their habits, and in short made himself thoroughly acquainted with their life-histories. We are sure that he must have experienced a feeling of regret at not being able, in the limited space at his disposal, to include the fuller details which filled his note-books to overflowing. The work is illustrated by 242 coloured plates, reduced from those of Lord Lilford, and with 65 photographic reproductions after Kearton, Miss Turner, and others. There are also plates of eggs after Hewitson, which are hardly so successful as the other figures.

The book begins with a useful Introduction, including a good essay on Bird Protection, and then goes on to well-written accounts of the various species. The only addition that we could desire is a brief sketch of the characters of each Family, such as is given under the Orders.

Mr. Coward's work is one of Frederick Warne's "Wayside and Woodland Series."

Harris on the Birds of Kansas City.

[Birds of the Kansas City Region. By Harry Harris. Trans. Acad. Sci. St. Louis, xxiii. 1919, pp. 213–371.]

Kansas City, though on the border of the State of the same name, is in Missouri, and is situated on the Missouri river at its junction with the Kaw. The chief characteristics of its bird-life are due to its position on the big river, which is the great highway of migration north and south.

Many of the birds formerly abundant in this region, and noted by the early travellers, have now become very scarce or have disappeared, such as the Wild Turkey, the Prairie Chicken, and the larger Birds of Prey; while the Passenger-Pigeon and the Carolina Paroquet are undoubtedly extinct. On the other hand, the clearing of the forest and cultivation of the land has resulted in an increase of such birds as the Dickcissel (*Spiza americana*) and the Blue Bird (*Sialia sialis*).

Mr. Harris has compiled a list of 343 birds found in this region. Of these 117 are breeding-birds. The status of each species is given concisely, and additional notes on the dates of arrival, of nesting and other matters of interest make up a most satisfactory account of the birds of this interesting and now commercially important region of the middle west of the United States.

Hopkinson on Gambian Birds.

[A List of the Birds of the Gambia. By Emilius Hopkinson. Brighton, 1919. Pp. 1–32.]

This list is partly compiled from other works, and partly gives information from the writer's own experiences in the most northerly of the British Possessions in West Africa. It is at present only a first instalment, which it is hoped to continue. Little is given under the specific name except the range and status of each form, but a trustworthy list of the birds of such a country must always be useful.

Jaarbericht, No. 9: Club van Nederlandsche Vogelkundigen.

In this year's bulletin we have articles on Netherland Ornithology, by Baron Snouckaert van Schauburg; on the question of the Origin of new Species by crossing, by Heer Stresemann; on the birds of Deli in Sumatra, by Heeren van Heyst, Van Balen, and others. There is also a sketch of the journey of Van Heurn between Java and America, as well as some remarks on *Buteo buteo ruficaudus* by Heer Heus.

Mathews on Australian Birds.

[The Birds of Australia. By Gregory M. Mathews. London: Feb. 16, 1920. Supplement No. 1, being Check-List of the Birds of Australia. Part I.—Orders Casuariiformes to Menuriformes.]

In this supplement Mr. Mathews gives under each genus and species every synonym known to him, with references to the Plates of his work and that of Gould. An attempt has been made, with the help of Dr. Richmond, to give the day on which each name was published, and we note that three new names are to be proposed in the next number of the 'Austral Avian Record.' The exact method of recording the names—that is, the type used in each case—is fully explained in the Introduction.

Mullens, Swann, and Jourdain on Ornithological Bibliography.

[A Geographical Bibliography of British Ornithology from the earliest times to the end of 1918, arranged under Counties. In Six Parts. By W. H. Mullens, H. Kirke Swann, and Rev. F. C. R. Jourdain. London, 1919. Parts 1 & 2, pp. 1–192.]

The authors tell us that "this work forms a supplement to, or continuation of, Mullens and Swann's 'Bibliography of British Ornithology' (Biographical volume), completed in 1917. It contains the books and articles in that volume arranged under counties, as well as a digest of the enormous mass of published contributions on local avifauna in scientific journals and periodical literature, of which very little indeed had been touched for the Biographical volume above mentioned." The aim is to give as complete an account as possible of the literature and records of each country, and has involved the examination of thousands of books. When completed the work will be exceptionally useful, as the publications of Coues, Carus and Engelmann, and Agassiz have long been out of date.

Many omissions and mistakes in those works are now corrected, and it is thus hoped to secure great accuracy coupled with full information.

Nicoll on Egyptian Birds.

[Hand-list of the Birds of Egypt. By M. J. Nicoll, Assistant-Director Zoological Service, Ministry of Public Works, Egypt. Cairo, 1919. Pub. No. 29.]

Mr. Nicoll has furnished visitors to Egypt with a very useful list, which will aid them to name their specimens. He gives the Latin name which he considers most easily understood, as well as the English appellation. Then follows a short description and a statement of the localities where the bird is found, with references to the works of Shelley and Gurney. The author has formed a collection of some 4000 skins during the past thirteen years, and has therefore the best of rights to his opinions on the avifauna. Thus his little book will be needed by all those in Europe who are working on Egyptian birds. Our only doubt is whether the descriptions are not too short for proper identification. Comparisons with allied species are not of themselves sufficient.

Robinson on Johore Fauna.

[Notes on the Vertebrate Fauna of the Pahang-Johore Archipelago. By H. C. Robinson. Journ. F.M.S. Museums, vii. pp. 325–329, pls. vi., vii.]

This short article gives a list of the birds of Pulau Tingyi, a mountainous island on the east of Johore, chiefly covered with heavy jungle. No new forms were obtained, but the author takes the opportunity of expressing his doubts as to the validity of certain subspecies of *Halcyon chloris* and two or three Passerine birds proposed by Mr. Oberholser. The plates are of island scenery.

Swann on the Birds of Prey.

[A Synoptical List of the Accipitres. Part II. (Erythrotriorchis to Lophoaëtus). By H. Kirke Swann. London, 1919. Pp. 39–74.]

Mr. Swann here continues his list of the diurnal Birds of Prey, the first part of which was fully noticed last year ('Ibis,' 1919, p. 777). He takes the opportunity to print some Addenda and Corrigenda to Part I. pp. 14–16.

Thorburn's Ornithological Sketches.

[A Naturalist's Sketch-Book. By Archibald Thorburn. London, 1919. 4to. Pp. i–viii, 1–71, pls. 1–60.]

The author here gives us a long series of beautiful illustrations of birds in his well-known style, interspersed with nearly a dozen of animals and plants. All of them are admirable, but we may specially call attention to those of Raptorial birds, Ducks, and Geese. We should have been glad to see a few more sketches of Terns, as we know that Mr. Thorburn has devoted considerable time to watching their evolutions and habits in general. Still, we are greatly pleased with those that have been provided from the author's various sketch-books, representing the work of some thirty years. They are nearly all taken from life, and therefore show the pose and tricks of habit of the species in a way that can only be attained by patient watching. Twenty-four of the plates are coloured, the remainder in collotype, and the latter include one or two of the haunts of the wilder species.

Wood on the Bird's Eye.

[The Fundus oculi of Birds, especially as viewed by the Ophthalmoscope: a Study in Comparative Anatomy and Physiology. By Casey Albert Wood. Pp. 1–180; 145 text-figs.; 61 coloured paintings. Chicago (Lakeside Press), 1917. 4to.]

The subject of the comparative structure of the eye in Birds is one which has been but little studied, and we much regret that this beautiful work has escaped our attention for so long. Colonel Casey Wood is an ophthalmic surgeon, and one of the leaders of his profession in the United States. He is also a lover of birds and an ornithologist, and he has devoted his leisure to the study of the bird's eye by means of the ophthalmoscope, an instrument by which the varying appearance of the back of the eyeball can be examined. With the help of Mr. Arthur W. Head, a well-known London artist, he has obtained a series of paintings showing the appearance of *fundus* or back portion of the eye in fifty-eight species of birds, and three reptiles and batrachians, and the reproductions of these paintings form perhaps the most attractive feature of the volume.

The text deals with the general structure of the bird's eye and the methods of examination and study used, while in Chapter ix. the appearance of the *fundus oculi* in the various Orders of birds is reviewed.

Colonel Wood believes that the *pecten*, that curious finger-like growth of blood-vessels projecting from the spot where the optic nerve enters the eye into the vitreous humor, is nothing but a carrier of pabulum to the eye and has no nervous or sensory function. This organ, which is peculiar to the avian eye, has an infinite variation of form and may possibly contribute characters of value in the classification of birds, as may also some of the other appearances of the *fundus oculi*. The other varying feature of the bird's eye is the position of the *macula lutea* or spot of perfect vision. In some cases there may be no apparent *macula lutea* at all; in other cases there are one or two of these spots, and it is among the birds which have the most perfect vision that two spots are developed. This is specially the case with the Accipitrine birds, which are able to adjust their eyes to monocular vision or to stereoscopic binocular vision at will, by the use of the two well-developed *maculæ*.

In addition to the paintings reproduced in colour, there are a great number of figures in the text elucidating the form of the *pecten* and the variation in the position of the *maculæ*.

The author believes that the eye of the bird is the most advanced and most highly specialized of all the organs of vision found in the class of Vertebrates, and that a study of the appearance of the back of the eye in healthy birds "may well furnish data for a classification of Aves ranking in importance with other taxonomic indications." Whether we agree with this conclusion or not, we may heartily congratulate Colonel Wood on having given us new light on a comparatively unknown department of ornithology, and of having enshrined it in a worthy and handsome volume.

List of other Ornithological Publications received.

Gladstone, H. S. A Naturalist's Calendar, kept by Sir William Jardine.

Kuroda, N. Descriptions of three new Birds from the southern islands of Japan (*cf.* Ibis, 1919, p. 547).

Mathews, G. M. Austral Avian Record. (Vol. iii. no. 8.)

Auk. (Vol. xxxvi. no. 4; Vol. xxxvii. no. 1.)

Avicultural Magazine. (Vol. x. nos. 12–14; Vol. xi. Nos. 1, 2.)

Bird-Notes. (Ser. 3, Vol. ii. nos. 11, 12.)

British Birds. (Oct.–Dec. 1919; Jan.–Mar. 1920.)

Canadian Naturalist. (Vol. xxxiii. nos. 4–6.)

Condor. (Vol. xxi. no. 5.)

Emu. (Vol. xix. pts. 1–3.)

Irish Naturalist. (Vol. xxviii. no. 9.)
Fauna och Flora. (1919, Häft 4.)
Journ. Bombay Nat. Hist. Soc. (Vol. xxvi. no. 3.)
Revue Française d'Ornithologie. (Nos. 126–129.)
Scottish Naturalist. (Nos. 93–98.)

XIX.—*Letters, Extracts, and Notes.*

Dear Sir,—I would be glad if you would kindly correct an error which appears in my letter on "*Hieraëtus ayresi*," which was printed in the October number of 'The Ibis,' 1919. The concluding lines should read: "which proves to be barely *sixteen* inches in length, and not 17¾ inches as stated in my notes."

I am,
Yours faithfully,
C. G. Finch-Davies
(Lt. 1st S.A.M.R.).

Roberts Heights,
Pretoria.
6 December, 1919.

Dear Sir,—A short time ago the Director of the South African Museum kindly sent me for examination the skin of a small Falcon, purporting to be a juvenile of the African Hobby *Falco cuvieri*. As soon as I saw the specimen it struck me that this was no Hobby, the wings being too short for any species of that group; and on further examining it I came to the conclusion that it was a young male of *Falco æsalon*. To make sure I took the specimen down to the Transvaal Museum for comparison with some young males of *F. æsalon* from Europe, and found it to agree with them in every respect. It is in the first juvenile plumage, which is not much worn. There are two feathers of the adult plumage amongst the upper tail-coverts, which are blue-grey with the characteristic dark shaft marks.

This specimen is labelled as having been procured at Durban, Natal. The question arises, is this locality correct; if so, it would mean an extraordinary extension of the range of this species, which, according to the latest B. O. U. List of British Birds, has not been recorded from further south in Africa than Nubia and Abyssinia.

The label is written in three different "hands." Firstly, there is in one handwriting the scientific name *Falco subbuteo*; *subbuteo* has been crossed out, and the specific name *cuvieri* written in Mr. W. L. Sclater's handwriting; in a third hand the locality, date, and collector's name thus: "Durban, Natal, February 1891, T. D. Butler," and on the reverse of the label in the same hand "To be mounted for the Museum."

I have written to the Director, Dr. L. Péringuey, for information as to the history of this specimen, and the following is an extract from his reply:—

"As to the place of origin of this skin, namely Durban, I take it to be a correct record. Butler, of this Museum, secured a few birds in Durban; the correction in Sclater's hand from *Falco subbuteo* into *Falco cuvieri* is probably due to its submittal to either Gurney or to the British Museum. You may rest assured that the bird was shot by Butler."

In a second communication he writes:—"Your letter to hand. The specimen of *Falco* I sent you is Butler's skin, the name *Falco subbuteo* juv. on the label is Trimen's (handwriting). The correction *cuvieri* is Sclater's. Butler recognises his own bird, he shot it in 1891 and at the same time a Coot that has not been identified as yet. There can be no doubt about the locality and the shooter."

The above would go to show that the locality as given on the label is correct, and this being so, *F. æsalon* must be added to the South African Avifauna, but only as a very rare and probably accidental wanderer. I have not the *slightest* doubt as to the correctness of my identification. I have examined a juvenile of *F. cuvieri*, which is a much darker and otherwise differently coloured bird, and has besides much longer wings, and is, in fact, a true Hobby.

I am,
Yours faithfully,
C. G. Finch-Davies
(Lt. 1st S.A.M.R.).

Roberts Heights,
Pretoria.
19 January, 1920.

The Systema Avium.

Dear Sir,—It is an excellent idea to have an English-speaking Peoples' Nomenclature for the birds of the world. Therefore, the 'Systema Avium,' undertaken by a combined Committee of the A. O. U. and B. O. U., when completed, will be more than welcomed by ornithologists in general.

But why limit the Commission to these two countries and not include representatives from the Royal Australasian Ornithologists' Union, the South African Union, &c.? If political delegates from these latter countries were competent to sit in the recent Council of Nations in France, surely in matters ornithological, experts in the same, may have an equal voice.

Referring to the "International Code of Zoological Nomenclature," as pertaining to ornithology, it has been "weighed in the balances and found wanting." Its very key-stone (bed-rock priority) is insecure—*i. e.* has no practical finality—a fatal flaw.

The only real road to finality, and that speedily, is for some competent body, such as an English-speaking Peoples' Commission, to issue An Authoritative List of bird-names—the oldest, if possible, but not necessarily. Then, time-honoured and appropriate names will have a chance, if they be not ornithologically incorrect. Take a simple instance. Almost every writer of importance for the last sixty years has used *Casuarius australis* for the Australian Cassowary—an appropriate and correct ornithological name. Now, for some supposed technical error, according to the "insecure key-stone" of the "International Code," we are informed we must employ the name *johnsonii* instead of *australis*. This adds confusion to the existing literature concerning the noble bird and is a drawback to the study of popular ornithology, which would be avoided were *Casuarius australis* declared "An Authoritative Name."

I am,
Yours, &c.,
Archibald James Campbell,
Colonial Member B. O. U.

Melbourne,
Australia.
15 January, 1920.

Annual General Meeting of the British Ornithologists' Union.

The Annual General Meeting of the British Ornithologists' Union for 1920 was held on Wednesday, March 10, at the Offices of the Zoological Society of London, Dr. W. Eagle Clarke, President, in the Chair.

There were thirty-eight Members present.

The Minutes of the last Annual Meeting were read and confirmed. The Accounts were accepted and passed.

The Committee recommended that Dr. P. R. Lowe, B.A., M.B., B.C., be elected a member of the Committee, in the place of Mr. H. E. Howard who retires by seniority. This recommendation was confirmed by the Meeting.

The Annual Report of the Committee was read as follows:—

"The Committee regret they have to report that, although the Accounts for 1919 balanced, the finances of the Union are not in a satisfactory condition. On the 1st January, 1919, there was a balance of roughly £140. The whole of this has been expended during the current year and, in addition, they have exhausted special donations amounting to £110.

"The cause of the increase in expenditure is entirely due to the increase in the cost of publishing 'The Ibis,' which has risen from roughly £700 in 1918 to £1,000 in 1919, and this although the increases charged both for letterpress and for reproduction of plates have not been so great as those generally obtaining in the trade. During the present year, a further increase of 25 per cent. will have to be met.

"It is evident, therefore, that receipts will not meet expenditure in future years unless some special arrangements are made. In 1916 the subscription to the Union was raised from 20*s.* to 25*s.*, and the Committee are loath to recommend a further increase until an effort has been made, and failed, to obtain the money by other means.

"When the Union was started, rules 7 and 8 read as follows:—

Rule 7. The funds derived from entrance fees and annual subscriptions shall be devoted primarily to the publication of 'The Ibis.'

Rule 8. Should the sum thus obtained be insufficient to cover the liability incurred, the deficit shall be raised by an additional subscription, to be levied at the ensuing General Meeting.

"For many years the subscriptions failed to cover the cost of publishing 'The Ibis,' and additional subscriptions were annually levied on all members to cover the deficit. These subscriptions were as follows:—

	£	*s.*	*d.*
1862	1	10	0
1863	1	10	0
1864	5	0	0
1865	8	0	0
1866	2	10	0
1867	5	0	0
1868	1	0	0
1869		5	0
1870		15	0
1871	1	1	0

"It was not until 1878 that 'The Ibis' was self-supporting, but even in that year a *guarantee* fund had to be taken from the members for the publication of the Index.

"In 1881 there was a substantial balance of nearly £100.

"In 1882 a British List of Birds was commenced, and in 1884 a heavy debt was incurred on this account, which was not entirely liquidated until 1886. In 1887 there was a balance of a little over £80.

"In 1896 and 1897 a General Index for Series 4, 5, and 6 was published, but the Union was unable to meet the whole of the expenses, and a considerable sum was paid by the President.

"In 1898 a contemplated Subject Index was abandoned for want of funds, but was again taken up and completed in 1899, though only partly paid for in that year, the balance being carried over and finally settled in 1901.

"In 1904 it was reported that for the first year on record there were no outstanding accounts and that there was a *genuine* balance of £36. In the years previous it is recorded that many writers had been called on to pay the expenses of their articles and plates.

"In 1909 the balance rose to £224, but decreased by £100 in the following year on account of the payment of cost of the publication of the Jubilee Supplement.

"It will thus be seen that the Union has always more or less depended upon donations from members, and has never really had a balance which it could devote to the advancement of Ornithology by any means other than the publication of 'The Ibis.'

"The Committee feel that this position is unworthy of a leading Ornithological Society, and that therefore some effort must be made to put it on a sounder financial basis.

"We are glad to be able to report that the Trustees of the British Museum have made a generous donation of £250 towards the cost of publishing Museum articles in 'The Ibis,' and it is hoped that the donation will be an annual one; but this alone will not suffice to meet the expected deficit.

"The Committee therefore recommend (1) That the Entrance Fee be increased from £2 to £4, and (2) That 'The Ibis' be sold to the public at the rate of 10*s.* per number, and to members at 8*s.* It is hoped that the amount received in this manner will approach another £200 per annum and that it may, together with the donation from the Trustees of the British Museum, meet the additional cost of publishing 'The Ibis.' If, however, it does not do so and also leave some balance in hand to meet anticipated expenditure on other publications, the Committee will be compelled to recommend an increase in the subscription at the next annual meeting.

"The last volume of 'The Ibis' is the sixty-first, and commences the eleventh series. It contains 826 pages, and is illustrated with twelve coloured plates, seven uncoloured plates, and three text-figures. The large size of the January number for this year is due to the fact that we have received several donations to enable us to pay for special articles and their illustrations, and subsequent numbers will probably revert to about their normal size.

"The sales of 'The Ibis' during 1919 have been very large owing to many persons who had ceased purchasing during the War making up their numbers. A few more Lists of Birds and copies of the General Index have also been sold."

The Committee regret to report the death of the following members since the last Annual General Meeting:—F. R. S. Baxendale, Dr. J. Wiglesworth, E. Gibson, and F. W. Headley.

The following gentleman has resigned:—C. M. Woodford.

The names of Messrs. W. W. Cordeaux, E. J. Johnstone, H. E. Rawson, J. Swinburne, and C. C. Treatt have been removed from the list of members under Rule 6.

The membership of the Union is given below in comparison with the previous five years:—

	1920.	1919.	1918.	1917.	1916.	1915.
Ordinary Members...	418	418	423	416	420	441
Extraordinary ,, ...	1	1	1	1	1	1
Honorary ,, ...	9	7	8	9	9	9
Hon. Lady ,, ...	8	8	8	9	8	6
Colonial ,, ...	10	9	9	10	10	10
Foreign ,, ...	16	13	20	19	19	20

There are forty candidates for Ordinary Membership, and it is hoped that in subsequent years there will be a still further large increase, a fact which the Committee has kept in mind when deciding not to recommend any increase in the rate of subscription for the present.

In regard to the Godman-Salvin Medal the Committee are able to report that £178 *7s.* 3*d.* has been subscribed as shown in the Balance Sheet, but £21 of this has to be credited to the General Memorial Fund, having been sent to the B. O. U. by mistake.

The amount will suffice to have a medal struck, and Mr. Wyon has already been entrusted with the work. It has been decided after consultation with various artists to have the heads of Messrs. Godman and Salvin depicted side by side on the face, and 'The Ibis,' as on our Journal, on the reverse, with an inscription "Presented to . . . ."

Messrs. Munt and Seth Smith were elected and consented to act as Scrutineers.

The following 40 candidates for Ordinary Membership were then balloted for and elected :—

William Henry Makens Andrews.
Charles F. Belcher.
Frederick Spencer Beveridge.
Major Frank William Borman.
Major Allan Brooks, D.S.O.
Thomas Alfred Coward, F.Z.S., F.E.S.
Jean Delacour.
Lt.-Colonel Henry Delmé-Radcliffe.
Charles Hilliard Donald.
Lt.-Commander Arthur Evans, R.N.
(Mrs.) Audrey Gordon.
Major Claude Graham.
Ludlow Griscom.
Eardley Holland, F.R.C.S.
George Rayner Humphreys.
Eng. Lt.-Commander Harold Hugh Huxham, D.S.O., R.N.
Charles Wilfred Janson.
Alexander Edward Jones.
Captain Lewis Richard William Loyd.
Frank Ludlow, M.A.
Leonard Percival Luke.
Colonel Alexander Francis Mackenzie, C.M.G., M.V.O.
Lt.-Colonel Henry William Madoc.
Dr. Harold Joseph Moon, M.R.C.S., L.R.C.P.

Donald Woodward Musselwhite.
Captain Thomas Nevill Carlton Nevill.
John Newman.
Harry Victor O'Donel.
Montagu Austin Phillips, F.L.S., F.Z.S.
Captain William Watt Addison Phillips.
Herbert Pratt.
Bernard John Ringrose.
Ernest Marcellus Skea.
Desmond Abel Smith.
Harry Kirke Swann, F.Z.S.
Lt.-Colonel Cudbert John Massy Thornhill, C.M.G., D.S.O.
Major Edward Hugh Ward, R.M.A.
Frederick John Waydelin.
William Beare Incledon Webber.
Commander Alec Thomas Lee Wilson, J.P., R.N.

The Committee recommended that in order to meet the increase in the size of the Union since its inception, the number of elected members of the Committee should be increased from three to six, making a total with the official number, of nine. This recommendation on being put to the vote, was carried unanimously.

The Committee, having recently had under consideration the accounts of rare or hitherto unknown bird visitors to Great Britain, felt it very desirable that some means should be employed by which these reports might be investigated and stamped with the Authority of the Union before being generally accepted. They accordingly proposed that the present Committee which deals with the B. O. U. List of British Birds should be enlarged and should in future deal with all cases of this nature, in addition to seeing that the list itself is kept up to date in every respect.

The Committee therefore proposed that a new Rule 16 should stand as follows :—

> " A Committee of nine elected members and the
> " Honorary Secretary of the Union as Secretary to

> "the Committee, with powers to co-opt shall be appointed to consider records of occurrences of rare and "hitherto unknown Bird Visitors to Great Britain, "and their decision upon the authenticity of the record "shall be published in the number of 'The Ibis' next "following the date of their decision."

An amendment to this was proposed by Mr. Bonhote, and seconded by Mr. Smalley:

> "That the Committee of the B. O. U. be asked to "consider the records of rare and hitherto unknown "Bird Visitors to Great Britain and generally to keep "the Union List up to date and that their decisions, "if any, be published once a year in the April number "of 'The Ibis'".

After considerable discussion the amendment was put to the vote and lost by thirty votes to eight.

Lord Rothschild then proposed and Mr. Evans seconded:

> "That the Committee be elected for five years and "run to coincide with the election of the President."

The Committee accepted this amendment, and the original proposal as amended by Lord Rothschild was then put to vote and carried by a very large majority.

Rule 16 will therefore read:

> "A Committee of nine elected members and the "Honorary Secretary of the Union as Secretary to the "Committee with powers to co-opt shall be appointed "to consider records of occurrences of rare and hitherto "unknown Bird Visitors to Great Britain, and their "decision upon the authenticity of the record shall be "published in the number of 'The Ibis' next following "the date of their decision. The nine members shall be "elected every five years and their election shall coincide "with the election of the President of the Union."

The Committee recommended that in addition to the present members consisting of Dr. Eagle Clarke, Mr. W.

L. Sclater, Dr. N. Ticehurst, and the present Honorary Secretary of the Union, that Mr. A. H. Evans, Dr. E. J. O. Hartert, Mr. T. Iredale, Rev. F. C. R. Jourdain, Mr. G. M. Mathews, and Mr. H. F. Witherby be elected.

The proposition was put to the meeting and, after several members had spoken on the matter, was carried by a majority of thirty-two.

The Committee recommended that the Entrance Fee to the Union be increased to £4, and that the sale of 'The Ibis' to the public be at the rate of 10*s*. per number, and that in future members purchasing back numbers shall pay 8*s*. per number. This was put to the meeting and carried unanimously. Rule 5 will therefore read as follows:—

> "Every new Ordinary Member shall pay an Entrance "Fee of £4, and an Annual Subscription of £1 5*s*. on "his election, and every Ordinary Member shall pay "an Annual Subscription of £1 5*s*. on the 1st January "of each year. Every new Ordinary Member failing "to pay his Entrance Fee and his first Annual Sub-"scription before the 31st December immediately "following his election shall have his election annulled, "unless he shall furnish a satisfactory explanation."

Votes of thanks to the Zoological Society proposed by the Rev. J. R. Hale and seconded by Mr. A. L. Butler, to the Auditor and Scrutineers proposed by Mr. J. L. Bonhote and seconded by Mr. G. M. Mathews, were carried unanimously.

Mr. D. Seth Smith proposed a vote of thanks to the Chairman, and Major C. W. Smeed to the Honorary Secretary, which were carried with acclamation.

The usual Dinner was held later in the evening at Pagani's Restaurant, in conjunction with the British Ornithologists' Club, which attracted a record attendance.

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Communications intended for publication in 'The Ibis' should be addressed to the **Editor**, 10 Sloane Court, Chelsea, S.W. 1 [during the next two months to the **Acting-Editor** (Mr. A. H. Evans), 9 Harvey Road, Cambridge].

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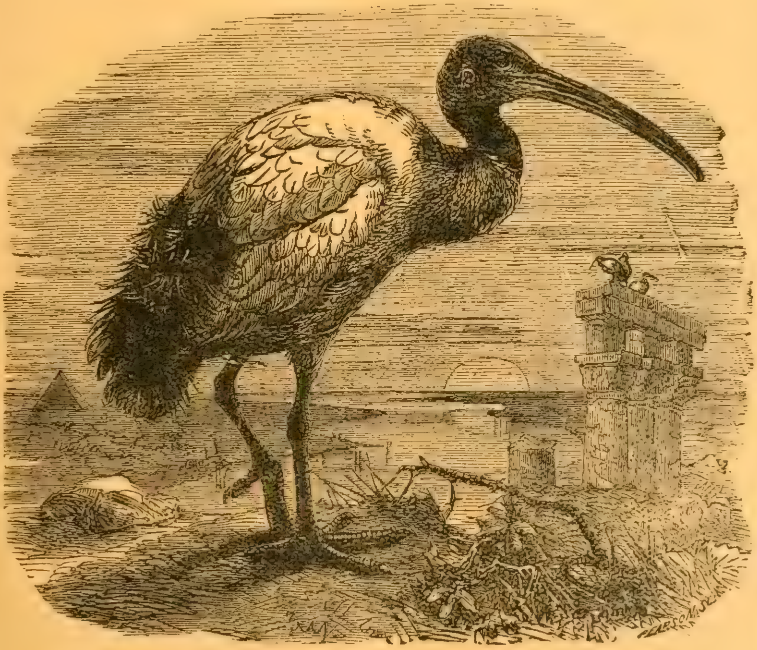

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XX.—*List of the Birds of the Canary Islands, with detailed reference to the Migratory Species and the Accidental Visitors.* Part VII. Summary and General Conclusions.

By David A. Bannerman, M.B.E., B.A., M.B.O.U., F.R.G.S.

(Plates XV. & XVI., and Sketch-map.)

[Continued from p. 360.]

Summary of Canarian Birds according to their Status.

The Canarian birds recognised in the present list number 217 in all. Of these 75 are regular breeding species and 142 are non-breeding.

The list may be further subdivided into the following categories, though it must be borne in mind that such classifications as these are necessarily not stringent; as with the B. O. U. List of Birds (though to a less extent) there are always some species which do not exactly fit into any of the groups.

The following abbreviations have been used, and when placed in square brackets after the specific name of a bird indicate that the species is also found in the list to which the letters refer, thus:—

[R.] = Resident ; [P.R.] = Partial Resident ; [S.V.] = Summer Visitor, [W.V.] = Winter Visitor ; [B. of P.] = Bird of Passage ; [A.V.] = Annual Visitor ; [O.V.] = Occasional Visitor ; [R.V.] = Rare Visitor.

A reference to the Part and to the page of 'The Ibis,' where the species is dealt with in detail, has also been appended.

The following species are **Residents**, *i. e.*, birds generally found in the Canary Islands throughout the year are included in this category ; it includes those which regularly breed in the Archipelago and which are not migratory in any way except perhaps between the islands. These number 61, viz. :—

	Part	Year	Page
Corvus corax [C. c. canariensis]	I.	1919	99
Pyrrhocorax pyrrhocorax	I.	,,	100
Carduelis carduelis parva	I.	,,	103
Serinus canarius	I.	,,	104
Erythrospiza githaginea amantium	I.	,,	104
Passer hispaniolensis hispaniolensis	I.	,,	104
Petronia petronia madeirensis	I.	,,	105
Fringilla cœlebs canariensis	I.	,,	106
Fringilla cœlebs palmæ	I.	,,	106
Fringilla cœlebs ombriosa	I.	,,	106
Fringilla teydea teydea	I.	,,	106
Fringilla teydea polatzeki	I.	,,	107
Acanthis cannabina meadewaldoi	I.	,,	107
Acanthis cannabina harterti	I.	,,	107
Emberiza calandra [E. c. thanneri]	I.	,,	107
Calandrella minor rufescens	I.	,,	111
Calandrella minor polatzeki	I.	,,	112
Motacilla cinerea [M. c. canariensis]	I.	,,	113
Anthus bertheloti bertheloti	I.	,,	116
Regulus regulus teneriffæ	I.	,,	119
Parus cæruleus teneriffæ	I.	,,	119
Parus cæruleus ombriosus	I.	,,	119
Parus cæruleus palmensis	I.	,,	120

	PART	YEAR	PAGE
Parus cæruleus degener	I.	1919	120
Lanius excubitor kœnigi	I.	,,	120
Sylvia atricapilla obscura	I.	,,	124
*[Sylvia atricapilla heineken]	I.	,,	125
Sylvia melanocephala leucogastra	I.	,,	125
Sylvia conspicillata bella	I.	,,	125
Phylloscopus collybita canariensis	I.	,,	130
Phylloscopus collybita exsul	I.	,,	131
Turdus merula cabreræ	II.	,,	297
Erithacus rubecula superbus	II.	,,	300
Erithacus rubecula microrhynchus	II.	,,	300
Saxicola dacotiæ dacotiæ	II.	,,	303
Saxicola dacotiæ murielæ	II.	,,	304
Dryobates major canariensis	III.	,,	457
Dryobates major thanneri	III.	,,	457
Tyto alba [? T. alba alba]	III.	,,	478
Tyto alba gracilirostris	III.	,,	478
Asio otus canariensis	III.	,,	479
Neophron percnopterus percnopterus	III.	,,	481
Buteo buteo insularum	III.	,,	482
Accipiter nisus teneriffæ	III.	,,	484
Milvus milvus milvus	III.	,,	485
Tinnunculus tinnunculus canariensis	III.	,,	492
Tinnunculus tinnunculus dacotiæ	III.	,,	492
Pandion haliaëtus haliaëtus	III.	,,	493
Chlamydotis undulata fuerteventuræ	IV.	,,	725
Œdicnemus œdicnemus insularum	IV.	,,	725
Œdicnemus œdicnemus distinctus	IV.	,,	725
Cursorius gallicus gallicus	IV.	,,	726
Scolopax rusticola	IV.	,,	728
Hæmatopus niger meadewaldoi	IV.	,,	732
Columba junoniæ	V.	1920	123
Columba bollei	V.	,,	124
Columba livia canariensis	V.	,,	124
Pterocles orientalis	V.	,,	127
Caccabis rufa [C. r. australis]	V.	,,	128
Caccabis petrosa kœnigi	V.	,,	128
Coturnix coturnix confisa	V.	,,	131

* An aberrant form of the preceding subspecies.

The following species are **Partial Residents**, *i. e.*, birds which are usually resident and breed in the islands, but which have their numbers augmented by fresh arrivals at certain seasons. These number 5, viz.:—

	PART	YEAR	PAGE
Upupa epops epops	III.	1919	472
Falco peregrinus pelegrinoides	III.	,,	487
Ardea cinerea [B. of P.]	IV.	,,	715
Ægialitis alexandrina alexandrina	IV.	,,	749
Larus argentatus cachinnans	IV.	,,	756

The following species are **Summer Visitors**, *i. e.*, birds which are found nesting regularly in the Canary Islands, but do not remain throughout the winter in the Archipelago. These number 9, viz. :—

	PART	YEAR	PAGE
Micropus murinus brehmorum	III.	1919	460
Micropus unicolor unicolor	III.	,,	465
Falco eleonoræ [B. of P.]	III.	,,	490
Sterna hirundo	IV.	,,	761
Puffinus kuhli fortunatus	V.	1920	106
Puffinus assimilis baroli	V.	,,	110
Bulweria bulweri bulweri	V.	,,	113
Streptopelia turtur turtur	V.	,,	124
Coturnix coturnix coturnix [B. of P.]	V.	,,	129

The following species are **Winter Visitors**, *i. e.*, birds found in the Canary Islands during the winter only, and which, when so denoted by an asterisk, have only exceptionally been known to breed in the Archipelago. These number 15, viz. :—

	PART	YEAR	PAGE
Sturnus vulgaris vulgaris [B. of P.]	I.	1919	100
Alauda arvensis arvensis [B. of P.]	I.	,,	110
Motacilla alba alba [B. of P.]	I.	,,	113
Turdus philomelus philomelus (*Turdus musicus* auctorum)	II.	,,	291
Anas platyrhynchos platyrhynchos [B. of P.]	IV.	,,	708
Querquedula crecca crecca	IV.	,,	710
Gallinago gallinago gallinago [B. of P.]	IV.	,,	729
Totanus hypoleucus	IV.	,,	738
Limosa limosa limosa	IV.	,,	740
Numenius phæopus phæopus [B. of P.]	IV.	,,	743
Squatarola squatarola [B. of P.]	IV.	,,	746
Vanellus vanellus [B. of P.]	IV.	,,	751
Arenaria interpres interpres [B. of P.]	IV.	,,	753
Larus fuscus affinis	IV.	,,	758
*Fulica atra atra	V.	1920	122

* Said to have bred.

The following species are **Birds of Passage**, *i.e.*, birds which pass regularly through the islands during the spring and autumn migration periods. These number 32, viz.:—

	PART	YEAR	PAGE
Sturnus vulgaris vulgaris [W. V.]	I.	1919	100
Alauda arvensis arvensis [W. V.]	I.	..	110
Motacilla alba alba [W. V.]	I.	..	113
Anthus trivialis trivialis	I.	..	116
Sylvia atricapilla atricapilla	I.	..	123
Phylloscopus trochilus trochilus	I.	..	127
Phylloscopus collybita collybita	I.	..	129
Phœnicurus phœnicurus phœnicurus	II.	..	298
Phœnicurus ochrurus gibraltariensis (*Ruticilla titys* auctorum)	II.	..	299
Saxicola rubicola rubicola	II.	..	304
Saxicola rubetra rubetra	II.	..	305
Œnanthe œnanthe [Œ. œ. leucorrhoa]	II.	..	307
Muscicapa grisola grisola	II.	..	312
Muscicapa atricapilla atricapilla	II.	..	313
Hirundo rustica rustica	II.	..	315
Delichon urbica urbica	II.	..	317
Micropus apus apus	III.	..	469
*Merops apiaster	III.	..	470
Falco eleonoræ [S. V.]	III.	..	490
Anas platyrhynchos platyrhynchos [W. V.].	IV.	..	708
Ardea cinerea [P. R.]	IV.	..	715
Gallinago gallinago gallinago [W. V.]	IV.	..	729
Limnocryptes gallinula	IV.	..	731
Tringa alpina alpina	IV.	..	734
Calidris arenaria	IV.	..	735
Machetes pugnax	IV.	..	736
Numenius phæopus phæopus [W. V.]	IV.	..	743
Squatarola squatarola [W. V.]	IV.	..	746
Ægialitis hiaticula hiaticula	IV.	..	747
Vanellus vanellus [W. V.]	IV.	..	751
Arenaria interpres interpres [W. V.]	IV.	..	753
Coturnix coturnix coturnix [S. V.]	V.	1920	129

* Said to have bred.

The following species are **Annual Visitors**, *i.e.*, birds which visit the Archipelago annually but at no fixed season of the year, and which have not been known to breed in any of the islands. These number 5, viz.:—

	Part	Year	Page
Thalassidroma pelagica	V.	1920	100
†Oceanodroma leucorrhoa leucorrhoa	V.	,,	101
Oceanites oceanicus oceanicus	V.	,,	103
Pelagodroma marina hypoleuca	V.	,,	103
Puffinus puffinus puffinus	V.	,,	105

† Usually in winter.

The following species are **Occasional Visitors**, *i. e.*, birds which do not occur regularly in the Archipelago every year, but which have been recorded from time to time, almost invariably during the migration period. Only two have been known to breed in the islands. These number 30, viz. :—

	Part	Year	Page
*Oriolus oriolus oriolus	I.	1919	102
*Sylvia simplex	I.	,,	123
*Phylloscopus sibilatrix sibilatrix	I.	,,	128
†Turdus musicus (*iliacus* auctorum)	II.	,,	294
*Turdus pilaris	II.	,,	297
*Riparia riparia riparia	II.	,,	319
*Riparia rupestris	II.	,,	320
*Cuculus canorus [C. canorus canorus]	III.	,,	458
*Cuculus canorus minor	III.	,,	459
*Coracias garrulus garrulus	III.	,,	477
†Sula bassana	III.	,,	494
‡Anas angustirostris	IV.	,,	709
Ciconia ciconia ciconia	IV.	,,	722
Platalea leucorodia	IV.	,,	723
*Glareola pratincola pratincola	IV.	,,	727
*Tringa minuta minuta	IV.	,,	733
*Tringa ferruginea ferruginea	IV.	,,	735
*Totanus totanus	IV.	,,	737
*Totanus nebularius	IV.	,,	737
*Totanus ochropus	IV.	,,	739
*Totanus glareola	IV.	,,	740
Limosa lapponica lapponica	IV.	,,	741
Numenius arquatus arquatus	IV.	,,	741
†Larus ridibundus	IV.	,,	759
†Rissa tridactyla tridactyla	IV.	,,	760
Sterna minuta minuta	IV.	,,	763
†Sterna sandvicensis sandvicensis	IV.	,,	763
†Porzana pusilla intermedia	V.	1920	118
*Crex crex	V.	,,	119
‡Gallinula chloropus	V.	,,	120

* During the migration seasons. † In winter only
‡ Has been known to breed

The following species are **Rare Visitors**, *i. e.*, birds which have occurred in the islands on two or three occasions only, sometimes singly after violent storms, but usually in company with other species during migration. These number 72, viz.:—

	PART	YEAR	PAGE
Corvus monedula spermologus	I.	1919	99
Sturnus unicolor	I.	,,	100
Chloris chloris aurantiiventris	I.	,,	103
Montifringilla nivalis nivalis	I.	,,	105
Emberiza striolata sahari	I.	,,	109
Plectrophenax nivalis	I.	,,	109
Melanocorypha calandra calandra	I.	,,	112
Motacilla flava [? M. flava flava]	I.	,,	115
Anthus pratensis	I.	,,	118
Lanius collurio collurio	I.	,,	120
Lanius senator senator	I.	,,	121
Sylvia communis communis	I.	,,	122
Acrocephalus arundinaceus arundinaceus	I.	,,	126
Hypolais pallida elaeica	I.	,,	126
Erithacus rubecula [? E. r. rubecula]	II.	,,	300
Cyanosylvia suecica suecica	II.	,,	302
Cyanosylvia suecica cyanecula	II.	,,	303
Œnanthe œnanthe œnanthe	II.	,,	306
Œnanthe stapazina stapazina	II.	,,	310
Œnanthe deserti homochroa	II.	,,	311
Muscicapa parva parva	II.	,,	314
Iynx torquilla torquilla	III.	,,	457
Clamator glandarius	III.	,,	460
Micropus melba melba	III.	,,	468
Merops persicus [? M. p. chrysocercus]	III.	,,	471
Alcedo ispida [? A. i. pallida]	III.	,,	475
Strix aluco	III.	,,	478
Asio flammeus flammeus (*A. accipitrinus* auctorum)	III.	,,	480
Circus æruginosus æruginosus	III.	,,	481
Circus pygargus	III.	,,	481
Haliaëtus albicilla	III.	,,	483
Pernis apivorus apivorus	III.	,,	485
Falco peregrinus	III.	,,	486
Falco subbuteo	III.	,,	488
Falco vespertinus vespertinus	III.	,,	492
Phalacrocorax carbo carbo	III.	,,	493
Mareca penelope	IV.	,,	711
Spatula clypeata	IV.	,,	712
Nyroca nyroca	IV.	,,	712

	PART	YEAR	PAGE
Nyroca ferina ferina	IV.	1919	713
Œdemia nigra nigra	IV.	,,	714
Phœnicopterus antiquorum	IV.	,,	714
Ardea purpurea purpurea	IV.	,,	717
Egretta alba alba	IV.	,,	718
Egretta garzetta garzetta	IV.	,,	718
Ardeola ibis ibis	IV.	,,	718
Ardeola ralloides ralloides	IV.	,,	719
Ixobrychus minutus minutus	IV.	,,	719
Nycticorax nycticorax nycticorax	IV.	,,	720
Botaurus stellaris	IV.	,,	721
Botaurus lentiginosus	IV.	,,	721
Ardeirallus sturmi	IV.	,,	722
Otis tetrax	IV.	,,	724
Gallinago media	IV.	,,	731
Himantopus himantopus	IV.	,,	745
Recurvirostra avocetta	IV.	,,	745
Charadrius apricarius	IV.	,,	746
*Ægialitis dubius curonicus	IV.	,,	749
Eudromias morinellus	IV.	,,	750
Pluvianus ægyptius	IV.	,,	752
Larus canus canus	IV.	,,	754
Larus marinus	IV.	,,	755
Larus fuscus fuscus	IV.	,,	757
Alca torda	V.	1920	97
Uria troille troille	V.	,,	98
Fratercula arctica arctica	V.	,,	99
Oceanodroma castro castro	V.	,,	102
Podiceps nigricollis nigricollis	V.	,,	116
Podiceps fluviatilis	V.	,,	116
Porzana porzana porzana	V.	,,	117
Porzana parva	V.	,,	119
Streptopelia turtur arenicola	V.	,,	127

* Has bred in the islands, and I consider that it will probably henceforth have to be included with the Occasional Visitors. I shot two and saw eight or nine birds in Gran Canaria on the 12th and 13th of February, 1920, after a violent south-westerly gale and dust storm.

The following species are placed in **Appendix A** *, which includes all birds that have been recorded on evidence which requires further proof before the species can be admitted to the list of authentic occurrences. These number 25, viz.:—

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* *Cf.* PART VI. 1920.

	PAGE		PAGE
1. Emberiza cia	324	14. Carine noctua	334
2. Anthus campestris	325	15. Hieraëtus fasciatus	335
3. Regulus ignicapillus madeirensis	326	16. Milvus migrans	335
4. Malaconotus poliocephalus	326	17. Anser anser	336
5. Melizophilus undatus	327	18. Querquedula querquedula	336
6. Acrocephalus aquaticus	328	19. Grus grus grus	337
7. Œnanthe isabellina	328	20. Puffinus gravis	337
8. ? Dryobates minor	329	21. Fulica cristata	338
9. Caprimulgus europæus	330	22. Porphyrio cæruleus	338
10. Caprimulgus ruficollis	330	23. Columba palumbus	339
11. Merops orientalis viridissimus	331	24. Columba trocaz	339
12. Halcyon leucocephala	332	25. Streptopelia senegalensis	340
13. Otus scops scops	333		

The following species are placed in **Appendix B** *, which includes all birds that have been recorded from unreliable sources and can be dismissed as absolutely valueless, though often quoted by more recent writers without additional proof. These number 54, viz. :—

	PAGE		PAGE
1. Pastor roseus	341	28. Gyps fulvus	352
2. Spinus spinus	344	29. Neophron pileatus	352
3. Pyrrhulauda modesta	345	30. Aquila maculata	352
4. Loxia curvirostra	345	31. Astur gentilis	353
5. Fringilla cœlebs spodiogenys	345	32. Milvus migrans	353
6. Emberiza citrinella	346	33. Falco æsalon	353
7. Emberiza hortulana	346	34. Falco naumanni	353
8. Galerida cristata	346	35. Phalacrocorax graculus	354
9. Motacilla lugubris	347	36. Sula sula	354
10. Sitta cæsia	347	37. Pelecanus onocrotalus	355
11. Sitta europæa	347	38. Phaëthon aëtherius	355
12. Lanius excubitor elegans	347	39. Ardea goliath	355
13. Lanius minor	347	40. Anthropoides virgo	355
14. Sylvia subalpina	348	41. Hæmatopus ostralegus	356
15. Sylvia orphea	348	42. Larus gelastes	356
16. Sylvia passerina	348	43. Larus minutus	356
17. Hypolais polyglotta	349	44. Sterna albigena	356
18. Turdus viscivorus	349	45. Sterna paradisea	357
19. Hylocichla ustulata swainsoni	349	46. Hydrochelidon nigra	357
20. Monticola solitarius	350	47. Uria grylle	357
21. Luscinia luscinia	350	48. Alle alle	357
22. Cinclus cinclus	350	49. Macronectes giganteus	358
23. Troglodytes troglodytes	350	50. Diomedia exulans	358
24. Hirundo rustica savignii	350	51. Rallus aquaticus	358
25. Picus viridis	351	52. Pterocles alchata	359
26. Glaucidium siju	351	53. Phasianus colchicus	360
27. Vultur ourigourap	352	54. Numida sp.	360

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* *Cf.* PART VI. 1920.

REVIEW OF THE ORNIS.—GENERAL CONCLUSIONS.

Having now completed the List of Birds of the Canary Islands and dealt at length with the migratory species, I propose to discuss some of the problems which the Ornis of the Archipelago suggests, especially as regards the distribution and affinities of the birds found therein and their bearing on the formation of the islands.

Geological Formation and Age of the Canary Archipelago.

Several theories have been advanced to explain the origin of the islands. It has been suggested that they are the remaining peaks of a sunken Atlantis which has long since been swallowed up in this region, or that the islands were formerly joined to the mainland of Africa, or again that they are merely "of volcanic origin." The evidence of geologists certainly points to the last explanation as the correct one.

Thanks to the famous voyages of the 'Challenger,' 'Michael Sars,' and other less celebrated ocean survey ships, the bed of the ocean west of Morocco is comparatively well known, and we are thus able to review this region with a certain amount of confidence. A glance at any recent map of the Atlantic Ocean reveals the fact that an enormous trough of great depth runs parallel with the West African coast-line, and is separated from a similar trough on the western side of the Atlantic by a gigantic submarine ridge. Glancing at the chart of the Eastern Atlantic we are struck by the fact that a long chain of islands lies on this submarine ridge or else between it and the African coast—the Azores, Porto Santo, Baixo Island, the Madeira Group, the Salvages and the Pitons, the Canaries, the Cape Verde Islands, St. Helena, Ascension, the Tristan da Cunha Group, and Gough Island. With the exception of two islands (Santa Maria and Majo) all these islands are mainly built up of volcanic rocks. Anyone who has travelled through the Canary Islands, particularly those of the eastern group, cannot but be struck by the volcanic nature of the ground. Evidence of terrible upheavals is to be seen on all sides—perfectly formed craters, immense lava flows, miles of volcanic soil, cliffs of basalt, tuff and volcanic debris meet the eye on all sides as one travels through almost any island in the group. To remind us that the Canaries are still the centre of a great volcanic zone we need only go back as far as 1909, when a small eruption took place on the Peak of Tenerife (Geog. Journ. vol. xxxv.).

Geologists have therefore concluded that the Canary Islands were built up from the ocean bed by volcanic action; the recent volcanoes have been shown by von Buch and others to be seated on a foundation of older rocks.

The theory that the islands were once joined to the mainland is considered by Lyell and others to be impossible—no change in the ocean bed having taken place since the islands were formed. The fauna of the Canaries also strongly refutes those who believe that the Archipelago was once connected with the mainland.

As to the islands being the remaining peaks of a sunken Atlantis there is no evidence whatever to support this view. In fact there are many signs that elevation has taken place, and no evidence of subsidence. As recently as 1912 the legend of Atlantis was strikingly revived in Paris by a distinguished French geologist, but a careful perusal of his paper*, though extremely interesting, has done little to convince me of its truth.

Although varying views are held as to how the islands were formed, there seems to be general accord as to the geological age of the Archipelago—and all agree that the Canaries were probably formed in the Miocene Epoch. Fossiliferous remains in Gran Canaria have been discovered which tend to prove that the island was thrown up from the floor of the ocean in that part of the Middle Tertiary Age known as the Upper Miocene. In the north-east of this same island lies an immense marine terrace of mighty marine conglomerates imbedded in which are calcareous layers of Miocene date.

In thus dating the birth of the islands it is interesting to note that it was about this same time—in the late Oligocene and early Miocene periods—that the great physical disturbances commenced which gave rise to the elevation of the Alps, and it was in the middle and latter part of the Miocene that probably the whole system of mountain-folds from Morocco to the far East took place.

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* Smithsonian Inst. Annual Report, 1915, p. 222.

Of the vegetation and climate in Africa at this period of the earth's history little is known. Wallace tells us that in the Miocene we had in Europe indications of a luxuriant vegetation and subtropical climate. On the whole the birds of Europe at this time were very like those now living, with the addition of a few tropical forms. Further back in the Eocene only forms of birds now extinct were to be found.

Knipe gives us a glowing account of vegetation in Europe during the Miocene. From his book* we gather that the high temperature continued in Europe for some time during this period; and the central lands of the continent remained rich with subtropical vegetation. Meanwhile the hardier growths had pressed far to the north . . . In the course of the period some decline of the European temperature took place; for palms began to languish, and conifers, grasses, and various deciduous trees reoccupied portions of their lost southern territory. The reduction in the heat, however, cannot have been very great; for camphor and cinnamon trees continued in abundance, and palms, though greatly reduced in number, were not entirely suppressed. Dealing with the birds of this period Mr. Knipe remarks: "More remarkable than the evolution of seals and whales from land-mammals was the rise of birds from reptiles, and their subsequent development into a vast variety of forms."

The physical conditions of Europe which existed in the early days of the Canary Islands—when presumably that Archipelago began to be inhabited by birds—are important considerations when we come to review the Ornis of the islands at the present day.

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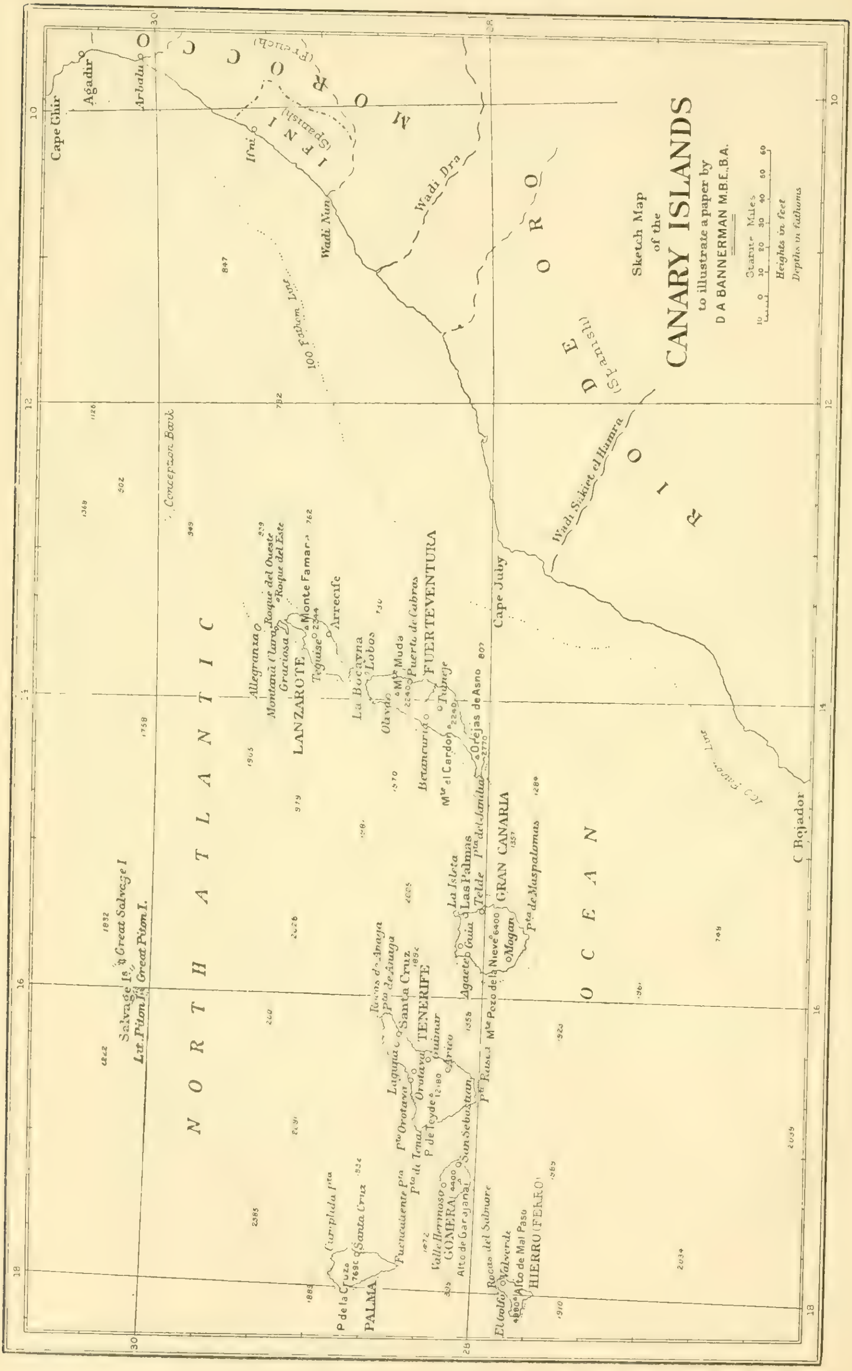
* 'Evolution in the Past,' 1912.

Physical characteristics of the islands at the present day.

In previous papers I have alluded to the remarkable difference which exists between the western islands and the eastern islands of the Canary Group and shall only briefly describe them here.

Eastern Group.

Generally speaking, the eastern group—Fuerteventura, Lanzarote, and their satellites—are of volcanic formation and consequently possessed of desert features. Fuerteventura viewed from the sea appears to be more mountainous than is really the case—the highest ground, a basaltic mass rising to 2770 feet, lying at the southern extremity of an isthmus of shifting sand dunes. The first impression is soon dispelled by a ride through the island—the hills on closer acquaintance are found to be low and undulating and bound great plains which stretch mile upon mile almost the entire length of the island. When I first set eyes upon these plains in the month of May, they were purple with the bloom of *Suæda fruticosa,* but otherwise, apart from a meagre desert vegetation, they are exceedingly bare and stony. Certainly in the neighbourhood of villages many acres are sown with wheat, but the corn is usually so poor in quality that it hardly serves to ameliorate the parched appearance of the country. Here and there rugged cone-shaped volcanoes stand out conspicuously, rising from 1500 to 2200 feet, and viewed from a distance appear almost beautiful in colour, the weathered lava, pumice, and scoriæ varying in tone from a deep terra-cotta to dull black. As the traveller looks down upon the plains from the central ridge, which forms a broken backbone to the island, several villages are spread out before his gaze—the little white houses scattered without plan over the desert waste. Perchance a cluster of date-palms indicates the homestead of one of the richer landowners, while only a few fig-trees or maybe a solitary pomegranate mark some poor farmer's


Sketch Map
of the
CANARY ISLANDS
to illustrate a paper by
D A BANNERMAN M.B.E., B.A.
Statute Miles
10 0 10 20 30 40 50 60
Heights in feet
Depths in fathoms
NORTH ATLANTIC OCEAN
MOROCCO
IFNI (Spanish)
(French)
RIO DE ORO (Spanish)
Cape Ghir
Agadir
Arbalu
Ifni
Wadi Nun
Wadi Dra
Wadi Sakiet el Hamra
Cape Juby
C Bojador
100 Fathom Line
Concepcion Bank
Salvage Is.
Great Salvage I
Great Piton I.
Lit. Piton I.
Allegranza
Montaña Clara
Graciosa
Roque del Oueste
Roque del Este
LANZAROTE
Monte Famara
Teguise
2344
Arrecife
La Bocayna
Lobos
Oliva
Mte Muda
2240
Puerto de Cabras
FUERTEVENTURA
Tuineje
Betancuria
Mte el Cardon
2249
Orejas de Asno
2770
Pta del Jandia
GRAN CANARIA
La Isleta
Las Palmas
Telde
Guia
Agaete
Nieve 6400
Mogan
Pta de Maspalomas
Mte Pozo de la Nieve
TENERIFE
Roques de Anaga
Pta de Anaga
Santa Cruz
Laguna
Guimar
Orotava
Pta Orotava
Arico
P de Teyde
12180
Pta de Teno
Pta Rasca
San Sebastian
GOMERA
4400
Alto de Garajonai
Valle Hermoso
Pta Fuencaliente
PALMA
Santa Cruz
Cumplida Pta
P de la Cruz
7690
HIERRO (FERRO)
Valverde
Alto de Mal Paso
4800
El Golfo
Roque del Salmore
10
12
14
16
18
28
30
1368
1126
502
847
782
762
939
949
1758
1905
979
730
807
1970
1281
1284
1357
2026
2005
1892
1832
200
222
1358
2191
1924
2385
1934
1872
1969
1910
1883
1769
1961
2039
2034
305

dwelling. Should the track lead near the sea the traveller will have to cross several deep *barrancos*—dry nullahs, often as not lined with dark green tamarisks, upon which the eye rests with pleasure after the glare of the scorching plains. Otherwise not a sign of water, not a vestige of forest land nor even a wood in the humblest sense of the word, breaks the monotony of the scene. It seems perfectly natural to have exchanged the mules of the western islands for camels—the only beasts of burden in the eastern group.

Lanzarote is more mountainous than Fuerteventura, but the highest ground attains to only 2198 feet. Nevertheless, its surface contains much more evidence of former volcanic activity—in the shape of many extinct volcanoes, from the rent craters of which great lava-flows wind their way to the sea. A ride from north to south of Lanzarote is much more instructive of the terrible visitations through which the island has passed than would be a similar journey through Fuerteventura.

The outlying islets embrace the same general characters—flat plains upon which miniature volcanoes stand up in vivid contrast, as typified by Graciosa; or else the half-buried lip of a giant crater-wall, so strikingly shown in the Roque del Este, rearing its crest above the waves.

The vegetation on these eastern islands is in keeping with their geological character—of engrossing interest to the student of desert flora,—the shrubs and plants are many of them peculiar to the islands upon which they grow. Apart from date-palms, figs, and pomegranates already noted, trees are conspicuous by their absence. Oranges, bananas, and almond trees are decidedly rare.

As previously indicated, many of the *barrancos* are lined with tamarisks, and in all the islands Euphorbias of several varieties are perhaps the commonest form of vegetation. Wheat and beans, vines and tomatoes are cultivated in certain districts, while quantities of onions are exported annually from Lanzarote. Through lack of water thousands of acres lie uncultivated in any way and may be classed as desert waste.

Such, then, are the eastern Canary Islands. Owing to their having the same geological formation and uniform climate, added to the similarity in their altitude and consequent absence of variety as regards vegetation zones, these barren outliers of the Sahara are best considered as one distinct faunal area.

THE WESTERN GROUP.

The first island of the western group encountered when sailing westwards from Fuerteventura is Gran Canaria—the subject of a paper which I wrote in 'The Ibis' in 1912. I then divided up the island into six faunal divisions:—(i.) The Monte and Vega; (ii.) the Cumbres; (iii.) the Pinar; (iv.) Desert-like plains; (v.) the "Charco"; (vi.) the western division (wild mountainous country). These are perfectly natural divisions and still, of course, hold good; their general features will be found fully discussed in the paper mentioned, where a map, showing the divisions here noted, is given.

During subsequent visits to the island in 1913 and 1920 I worked out the faunal divisions strictly according to the zones of vegetation, which are necessarily rough. The conclusions which I formed are as follows:—

Zone i. Maritime or African zone, sea-level to 1000 feet.

Zone ii. District of cultivation, 1000–3000 feet (including remnants of Chestnut and Laurel forest between 1400 and 2700 feet).

Zone iii. "Pinar" (Pine forest), 3000–4000 feet (on the south of the island only). The country between these altitudes in the north of the island may be included in

Zone iv. "Cumbres" mountainous unforested zone, 4000–6400 feet.

In comparison with the eastern islands water is plentiful; the result is abundantly evident, particularly in Zone ii. (*vide* Ibis, 1912, pp. 557–567).

When we turn to the island of Tenerife we find the zones of vegetation much more clearly defined—moreover, more attention has been paid to the botany of Tenerife than to any other member of the group, and we have, therefore, ample material upon which to base our deductions.

Humboldt recognised four distinct zones of vegetation; Dr. Christ preferred three great zones; Guppy divided the vegetation into six belts. Lastly, we have the thoroughly up to date and clearly expressed opinions of Dr. J. H. Salter, whose treatise on the Regional Distribution of the Native Flora in Tenerife appeared as part vii. of vol. lxii. of the Manchester Memoirs (1918).

Dr. Salter, with Dr. Christ, recognises three main regions—each of which he subdivides into more or less clearly defined zones. With Dr. Salter's conclusions, in so far as I have studied the regional distribution in Tenerife, I entirely concur; moreover, from personal observation I can endorse his remark that the zones can only be characterized in general terms and that they are separated by no hard and fast lines—the range of most species extending higher upon the southern side of the central ridge than upon its northern slope. Strict demarcation of the zones is quite impossible; bearing this in mind, let us examine the vegetation belts propounded by Dr. Salter:—

A. *The Coast Region and Lower Slopes* from sea-level to 2400 ft., comprising (on the southern coast*):—

1. Foreshore.
2. Desert (stony, rocky, or black sand).
3. Orchards, plantations, vineyards (banana, tomato, orange, vine), extending to about 1300 ft.
4. Cultivated lands (wheat, potatoes, lupins, broad beans), extending to about 2060 ft.

B. *The Cloud Region*, 2300–6500 ft.

1. The Monte Verde, from 2400–4000 ft., characterized by woods and thickets of evergreens (far from being a continuous belt).

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* Upon the northern slopes the desert strip is much reduced or altogether absent.

2. The Pinar, from 4000–6000 ft., characterized by *Pinus canariensis.*
3. Zone of shrubby foliose Leguminosæ, 6000–6500 ft., the Escobón (*Cytisus prolifer*), and the Codésco (*Adenocarpus viscosus*), the chief fodder plants.

C. *Above the Clouds,* 6500–12,180 * ft.

1. The Cañadas, Zone of the Retáma (*Spartocytisus nubigenus*), reaching to almost 10,000 ft.
2. The Alpine Zone, 10,000–12,180 * ft., where an endemic viola, a moss, and a lichen occur.

The island of Palma, famous for its immense crater—over four miles in diameter and 5000–6000 feet deep—is the only other of the western islands the vegetation of which we shall discuss. Deforestation has taken place to a much less extent than in Tenerife, and *Pinus canariensis* covers a large area of country. Accounts of the vegetation of Palma are scarce—the best and most recent paper, by T. A. Sprague and J. A. Hutchinson, appeared in the Kew Bulletin, 1913, part 8, pp. 287–299. These gentlemen visited the island in May–June 1913. From their account we gather that cultivation takes place mainly between 1000 and 2000 feet, the principal crops being onions, grapes, maize, and wheat, while mulberry and fig trees are numerous. The woods of the lower slopes of the cloud-belt appear to consist mainly of typical Laurel, *Myrica faya, Erica arborea,* and *Ilex canariensis,* with undergrowth of *Cistus* and bracken reaching their fullest development between 3000 and 4000 feet. At 4700 feet the vegetation consists mainly of Pines, tree-heaths, and bracken; above this altitude the upper ridges are clothed with pine woods practically destitute of vegetation. The highest ridge reaches an altitude of 7690 feet, culminating in the Pico de Muchachos above the Gran Caldera, but the greater part of the central backbone of the island lies between 4750 and 6500 feet.

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* Dr. Salter gives this figure as 12,912 ft., probably a misprint for 12,192. I am informed at the Royal Geographical Society that the Peak of Tenerife was ascertained to be 12,180 ft. according to the latest maps.

Before these pages are in print I shall, I hope, have visited Gomera and Hierro in person, and shall take special note of the vegetation zones which in the last two islands, at any rate, appear to be little known; Gomera, I understand, somewhat resembles Palma in its vegetation—the high ground being clothed with forests. Hierro, on the other hand, is much less wooded, but the vegetation zones of these two islands require to be more carefully studied before we can say to what extent the indigenous birds have been affected by the local conditions. To this I shall pay particular attention during my forthcoming trip *.

Factors influencing the character of the native flora are summed up by Salter under three headings: (1) long isolation, (2) volcanic origin, (3) climate. It is particularly interesting to the ornithologist to learn that, as pointed out by Hooker many years ago, the Canarian flora is more nearly allied to Mediterranean species than to Moroccan forms, and that from this Engler considered the flora of the islands in all probability to be a survival of the flora of the Tertiary period—more tropical in character than that which belongs to North Africa and the Mediterranean Region at the present time. According to Sauer, out of a total of 1250 Canarian plants, 333 are endemic. If a fresh census were taken now, I believe both the number of Canarian plants and of the endemic forms could be greatly increased.

Turning once more to the birds, ornithologists have often marvelled that the Canaries are inhabited by such a remarkable number of good geographical subspecies, and I have on several occasions been asked to explain the reason.

Knowing the islands as I do, I feel that this can never be accomplished satisfactorily until some knowledge of the widely differing types of country which are to be found in the Group—often, indeed, in the same island—has been acquired. I therefore make no apology for having attempted to place the reader in possession of some, at any rate, of the all-important physical conditions existing in the islands,

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* The writer succeeded in riding across and partly exploring Gomera in March of this year, but was unable to visit Hierro.

both in the past and at the present day*. It will be apparent how important a part the vegetation of the Canaries has played as an element in the variation of species.

Distribution of Species and Subspecies.

In studying the distribution of insular fauna it would be difficult to find a more ideal Archipelago upon which to centre one's attention than the one under discussion, at any rate in the Atlantic Ocean.

For the variety of peculiar forms which it contains and the remarkable distribution of many of the species, the Canary Archipelago can be considered second to none.

The Azores have, I am aware, been cited as the most interesting of all the Atlantic Archipelagos from an ornithological point of view, but that was before the birds of the Canary Islands were as well known as to-day, and the idea arose in no small part from their great distance from any continent.

Let us first turn our attention to the truly Resident Birds of the Canary Islands and glance down the list of these on pp. 520, 521. We find that they number 61, all of which (with a single exception) are what we may term land birds. The exception is an Oystercatcher, of which more hereafter.

Of these 61 Resident Birds no fewer than 52 are confined to the Atlantic Islands [the Canaries, Madeira, Azores, and Cape Verde Groups]. These are divided as follows:—

42 are confined to the Canary Islands.
6 ,, ,, ,, Canaries and Madeira.
3 ,, ,, ,, Canaries, Madeira, and Azores.
1 is ,, ,, Canaries, Madeira, and Cape Verde Is.

9 have a general distribution in Europe and Africa.

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* In this connexion, and to save repetition, I would draw the attention of the reader to 'Ibis,' 1890, pp. 67–76 (a description of Palma by Canon Tristram); 'Ibis,' 1912, pp. 557–567 (a description of Gran Canaria, map, and photographic illustrations); and 'Ibis,' 1914, pp. 38-90 (a description of all the islands of the Eastern Group, map, and illustrations), the last two articles by the present writer.

RESTRICTED TO THE CANARIES.

1. Corvus c. canariensis.
2. Erythrospiza g. amantium.
3. Fringilla c. canariensis.
4. Fringilla c. palmæ.
5. Fringilla c. ombriosa.
6. Fringilla teydea teydea.
7. Fringilla teydea polatzeki.
8. Acanthis c. meadewaldoi.
9. Acanthis c. harterti.
10. Emberiza c. thanneri.
11. Calandrella m. rufescens.
12. Calandrella m. polatzeki.
13. Motacilla c. canariensis.
14. Anthus b. bertheloti.
15. Regulus r. teneriffæ.
16. Parus c. teneriffæ.
17. Parus c. ombriosus.
18. Parus c. palmensis.
19. Parus c. degener.
20. Lanius e. koenigi.
21. Sylvia m. leucogastra.
22. Phylloscopus c. canariensis.
23. Phylloscopus c. exsul.
24. Erithacus r. superbus.
25. Saxicola dacotiæ dacotiæ.
26. Saxicola dacotiæ murielæ.
27. Dryobates m. canariensis.
28. Dryobates m. thanneri.
29. Tyto a. gracilirostris.
30. Asio o. canariensis.
31. Buteo b. insularum.
32. Accipiter n. teneriffæ.
33. Tinnunculus t. dacotiæ.
34. Chlamydotis u. fuerteventuræ.
35. Œdicnemus œ. insularum.
36. Œdicnemus œ. distinctus.
37. Hæmatopus n. meadewaldoi.
38. Columba juno niæ.
39. Columba bollei.
40. Columba l. canariensis.
41. Caccabis r. australis.
42. Caccabis b. koenigi.

RESTRICTED TO CANARIES AND MADEIRA.

1. Petronia p. madeirensis.
2. Sylvia a. obscura.
3. Turdus m. cabreræ.
4. Erithacus r. microrhynchus.
5. Tinnunculus t. canariensis.
6. Coturnix c. confisa.

RESTRICTED TO CANARIES, MADEIRA, AND AZORES.

1. Carduelis c. parva.
2. Serinus canarius.
3. Sylvia a. heineken.

RESTRICTED TO CANARIES, MADEIRA, & CAPE VERDE IS.

1. Sylvia c. bella.

OF GENERAL DISTRIBUTION.

1. Pyrrhocorax pyrrhocorax.
2. Passer h. hispaniolensis.
3. Tyto alba.
4. Neophron p. percnopterus.
5. Milvus m. milvus.
6. Pandion h. haliaëtus.
7. Cursorius g. gallicus.
8. Scolopax r. rusticola.
9. Pterocles orientalis.

Apart from anything else such restricted insular distribution is very remarkable, but of more interest still is the distribution of the different groups of birds in the various islands.

Those who have read my description of an expedition which I made to the Eastern Canary Group in 1913 (the report of which appeared in 'The Ibis,' 1914, pp. 38–90, 228–293) will not be surprised to learn how strikingly different is the avifauna in those barren islands, for they will be already aware of the peculiar physical characteristics enjoyed by Fuerteventura and Lanzarote and the contrast which exists between them and the islands of the western group—Gran Canaria, Tenerife, Palma, Gomera and Hierro—briefly alluded to in the early part of this paper. Detailed insular distribution in the Archipelago is given for each bird in the Systematic List in my present paper, but a more general review of the range of certain species will serve to show how limited this distribution often is.

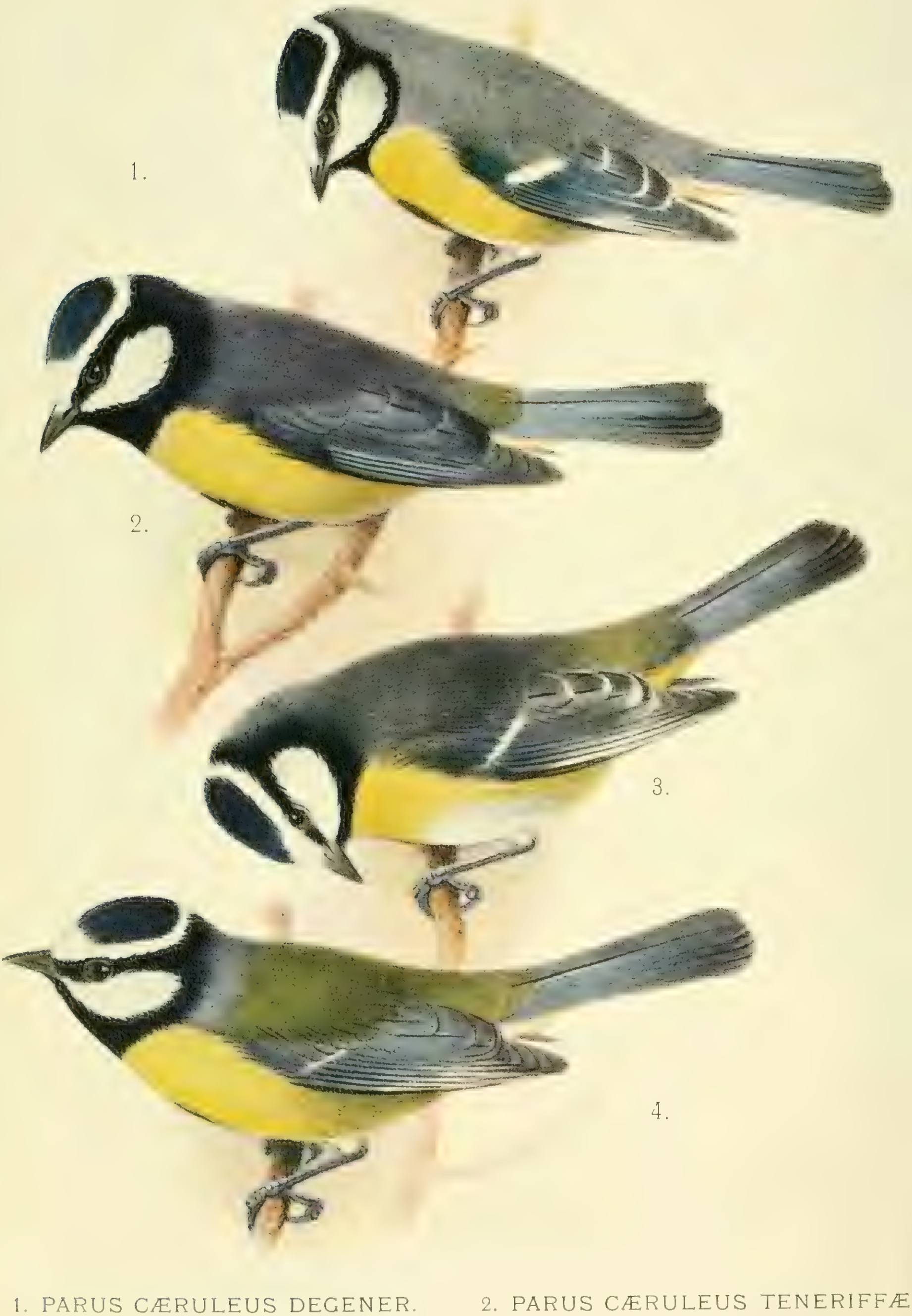
There are very few Resident birds which can be said to have anything like a general distribution in the Archipelago—that is to say, the same species or subspecies being found on all the seven large islands—in fact, only seven in all:—*Corvus corax canariensis*, *Emberiza calandra thanneri*, *Anthus bertheloti bertheloti*, *Sylvia melanocephala leucogastra*, *Buteo buteo insularum*, *Pandion haliaëtus haliaëtus*, and *Columba livia canariensis*.

The Kestrel is also found in all the islands, but is represented in the western and eastern groups by two distinct geographical races, *Tinnunculus t. canariensis* in the western, *T. t. dacotiæ* in the eastern group.

The Brown Linnet has found its way to every island, and is represented in the eastern group by *Acanthis cannabina harterti*, and in the western group by *A. c. meadewaldoi*.

The same remark applies to the Thick-knee, *Œdicnemus œ. distinctus* being found in the western group, *Œ. œ. insularum* in the eastern group.

Likewise the Titmice have spread over the entire Archipelago, but have branched into various subspecies, each race



1. PARUS CÆRULEUS DEGENER. 2. PARUS CÆRULEUS TENERIFFÆ.
3. PARUS CÆRULEUS PALMENSIS. 4. PARUS CÆRULEUS OMBRIOSUS.

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inhabiting one or more islands, but never, of course, more than one form in an island. We find *Parus cæruleus teneriffæ* in Gran Canaria, Tenerife, and Gomera, *P. c. ombriosus* in Hierro, *P. c. palmensis* in Palma, *P. c. degener* in Fuerteventura and Lanzarote.

The above mentioned are the only Canarian species with representative races in all the large islands.

Of the rest of the Resident Avifauna the most interesting from the point of view of distribution are the Chaffinches, of which there are five representatives in the western islands and none in the eastern islands. The remarkable Blue Chaffinch, confined to the pine forests of Tenerife, *Fringilla teydea teydea*, and its subspecies (*F. t. polatzeki*) confined to the pine forests of Gran Canaria, are perhaps the most ancient types of bird-life to be found in the Archipelago, for they have no closely allied form anywhere in the world.

The other three Canarian Chaffinches are by some ornithologists concluded to be geographical races of our European bird *Fringilla cœlebs*, i. e. *Fringilla cœlebs canariensis*, which inhabits Gran Canaria, Tenerife, and Gomera, *F. c. palmæ*, which is confined to Palma, and *F. c. ombriosa* to Hierro. They are such distinct forms that many consider them "good species," and although I have treated them as subspecies in this paper, I feel that I am perhaps in error in having done so.

It will be noticeable that this is the same insular distribution as we found amongst the Titmice. The same Chaffinch and the same Titmouse inhabit Gran Canaria, Tenerife, and Gomera, while two different Chaffinches and two different Titmice frequent Palma and Hierro respectively. The only difference is that whereas the Titmice have a representative race in the eastern group the Chaffinches are confined to the western islands.

There are other curious instances of distribution where two distinct races are found in the western group alone. For instance, Tenerife and Gran Canaria, each has its own Great Spotted Woodpecker, *Dryobates major canariensis* and *D. m. thanneri* respectively.

There are two Redbreasts: *Erithacus rubecula superbus* in Gran Canaria and Tenerife, *E. r. microrhynchus* in Palma, Gomera, and Hierro.

Two Short-toed Larks: *Calandrella minor rufescens* confined to Tenerife, *C. m. polatzeki* found in Gran Canaria in the western group but also living in Fuerteventura and Lanzarote in the eastern group; though according to some authorities the Gran Canarian Lark is intermediate between the two forms and has been named by Sassi *C. m. distincta*.

In the eastern group we find a similar case in the two Chats, *Saxicola dacotiæ dacotiæ* confined to Fuerteventura, *S. d. murielæ* occurring only on Allegranza and Montaña Clara, two of the outer islets.

Several birds are found in one island only without representative races. The Sand-Grouse (*Pterocles orientalis*) is confined to Fuerteventura; the Chough (*Pyrrhocorax pyrrhocorax*) to Palma.

These are not by any means the only cases of curious distribution which we might instance; the apparent absence of the Egyptian Vulture, Kite, and Partridge from Palma are all difficult of explanation, but there must be a reason for the anomaly if only we could find it. These birds all swarm in the adjoining islands. Food may account for the absence of the Partridge, but not for the other birds named.

Even more remarkable is the apparent absence of any Woodpecker from the pine forests of Palma, Gomera, and Hierro, although the genus is represented by distinct subspecies of the Great Spotted Woodpecker in both Tenerife and Gran Canaria. From the pines of Tenerife we practically gaze down upon the island of Gomera! but the Woodpeckers have never spread beyond their own domain.

Undoubtedly the distribution of many Canarian land forms depends to a very large extent on the physical characteristics of each island. We should naturally not expect to find Chaffinches in the desert eastern islands where trees are rarer than volcanoes, any more than we should look for Sand-Grouse in Palma. Even in such islands as Tenerife and Gran Canaria the distribution of the two Teydean Chaffinches is bounded absolutely by the limits of the pine forests, which once covered a much larger extent of land than they do at the present day. Marsh breeding-birds—such as the Marbled Duck, the Coot, and the Moorhen—must, since the ancient lake at Laguna is no more, be restricted almost entirely to the Charco's of Maspalomas and Arguineguin in Gran Canaria.

Special vegetation means special food upon which many seed- and fruit-eating species are entirely dependent. The two fine Canarian Pigeons live almost entirely on the seeds of certain trees ; *Columba bollei* and *Columba junoniæ* subsist to such an extent on the fruit of *Laurus fœtens* that when the laurel was exterminated in Gran Canaria *C. bollei,* which formerly thrived in that island, completely disappeared. There is no Laurel Pigeon in Hierro, for the Laurel and Til-tree are almost absent. Instances could be multiplied, but that mentioned will illustrate my point.

Reference must be made here to the remarkable distribution of two of the Tubinares which visit the Canaries to breed. *Puffinus assimilis baroli* is the only form of the *assimilis*-group of Shearwaters which is found in the Atlantic, where it is confined to the north Atlantides from the Azores to the Canaries. The other members of the group inhabit widely separated localities in the Pacific and Indian Oceans.

Perhaps the most remarkable case of all is that of Bulwer's Petrel. In the Atlantic it inhabits the same Archipelagos as the Madeiran Allied Shearwater, but its nearest allied race inhabits the Sandwich Islands in the Pacific; no intermediate subspecific races are known.

The explanation of this discontinuous distribution must be looked for in the great antiquity of the order to which the Petrels and Shearwaters belong, combined with the changes which have taken place in the distribution of land

and water on the surface of the earth. The Atlantic Islands, at any rate the Canaries, were probably formed in the Miocene. The Hawaiian Islands are apparently of earlier date, and it was during, or prior to, the Eocene that the Atlantic and Pacific Oceans were joined—for the isthmus of Panama had not then appeared above the waves. There was then free communication between the two oceans, the fauna of which was similar in certain features. As a relic of this fauna we may instance the curious Blenny (*Enneanectes carminalis*) which was found by Dr. Lowe on the Atlantic side of the isthmus and which had previously only been known from the Pacific. Once the continents of North and South America were connected by land, an insuperable barrier would prevent the birds on the Pacific side from having any communication with the birds on the other. Bulwer's Petrel (and probably other forms as well) would then be isolated on the Hawaiian Islands and cut off from intercourse with the species on the Atlantic side. Each would tend to differentiate, but being sea-roving species, when conditions are much alike, they would naturally not be influenced by such diverse factors as if they had been land birds. As a result, the representatives of Bulwer's Petrel in the Atlantic and in the Sandwich and Bonin Islands in the Pacific are very slightly differentiated, and have until quite recently been considered identical.

Whether Bulwer's Petrel ever inhabited any of the islands off the Atlantic coast of America is unknown. If it did so it has long been exterminated and no trace of its former existence in this region has been left. The evidence seems to point to the conclusion that the Canarian Bulwer's Petrel is descended from the Pacific birds, and not the Pacific subspecies from the typical Atlantic form. An even more remarkable fact in the distribution of Bulwer's Petrel was pointed out by Messrs. Iredale and Mathews (Ibis, 1915, pp. 607, 608). These authors note the difficulty of separating even subspecifically Atlantic Island birds from those of the Sandwich Islands and the Bonin Islands, while in the Fiji Islands a distinct *species* of *Bulweria* occurs.

Formation of Insular Races.

In recent years very close attention has been paid to the investigation of geographical races—subspecies as we term them to-day. As a result of this search for new forms (which has been sadly abused by some, who have thus brought the careful work of many systematic workers under the lash of those ornithologists who have clung to the older traditions) the trinomial system of nomenclature has gradually come more and more into general use. This is not the place to enter into a discussion as to the merits or demerits of the system, but in a paper dealing with insular races the utility of the trinomial system is indisputable and must be apparent to anyone who studies the question with an unbiased mind. Whereas under the old binomial system the geographical races of the Canarian avifauna were given the status of species, we now realise that many of the birds in these islands are really only insular forms of a continental parent race from which they have sprung. In some cases the distinction may be only small, in others much greater differentiation will be found, depending on the amount of variation which has taken place; but in both cases the bird can be considered a subspecies (and for the purposes of classification it is usually more convenient to do so), and as such is named trinomially. The dividing line between a subspecies and a species is difficult to define, and this is where the champion of the binomial system generally commences his argument!

All field naturalists and many purely systematic ornithologists know how many and varied are the factors which combine to bring about variation in a bird. It may be quite by chance—for a few wanderers blown out of their usual course may have been compelled to take refuge on some oceanic island and there have come under the influence of the very factors which would most likely tend to produce variation in their case.

This is exactly what has happened in certain cases in the Canary Islands, and although those who have studied the evolution of birds will not find anything new in the following pages, yet to some the facts contained may be of interest, and I shall therefore attempt to describe the factors which have brought about such a remarkable differentiation of forms as we find in the Canary Islands to-day.

Let us suppose for a moment that a small flock of Passerine birds which have been wintering on the Guinea coast are wending their way north to breed in Europe. Strong westerly winds prevail, and the birds which usually hug the coast of Africa are blown considerably out to sea, till by chance they sight the island of Tenerife and make towards it. Having gained the island they find themselves in an environment which, from their point of view, is all that can be desired. An abundance of fruit and of insect life, plenty of food, no lack of cover, a climate very similar at this time of early spring to that which they had hoped to find at their journey's end—hundreds of miles farther north. Is it to be wondered that of this little flock, when the wind drops and the rest set out again on their long journey, a pair or two should remain and breed in the island.

Having escaped the worst enemies in the form of Sparrow-Hawks, a brood is successfully reared; and in course of time the species increases and spreads to other islands of the group. These newly arrived immigrants at once come under a host of fresh influences. In course of ages variation takes place in more than one direction brought about by the varied factors which they meet with in the different islands, some of which we shall now discuss.

Darwin has shown that the **Presence of Enemies** or the presence or otherwise of other species, with which an immigrant has to compete in its struggle for existence, has as much to do with the differentiation of a species as the physical conditions of the country. Had the Canary Islands been of continental origin, we should probably have found terrestrial mammals and rodents, as well as snakes, living in most of the islands, which would have preyed on the ground-nesting birds, and in various ways influenced the avifauna. But it is a remarkable fact, and one which strongly negatives the view that the Canaries were ever joined to the continent, that the only mammals which have found their own way to the Archipelago and have not been introduced, are those which could fly there—members of the family Vespertilionidæ or Typical Bats.

The birds which had already settled in the islands are then the only species with which succeeding immigrants would have to contend; for it does not appear that mammalia in any form inhabited the Archipelago in past epochs of its history.

"Enemies" in the Canary Islands at the present day are few in kind—small boys, "sportsmen"—collectors of eggs and of cage-birds being the most destructive.

Of Raptorial birds the Barbary Falcon, Buzzard, ? Kite, and Sparrow-Hawk probably do the most harm, for the Kestrels, which swarm, pay little attention to the other birds in the islands. The mongoose and snakes are unknown and rats are confined to the towns, so that, on the whole, the islands may be said to be singularly free from many of the dangers which beset continental species. Of pugnacious varieties which live in the islands the Spanish Sparrow easily takes first place, and to this bird is probably due the failure of the Hirundinidæ to nest in the Archipelago. Swallows or Martins would have little chance of using the nests which they built.

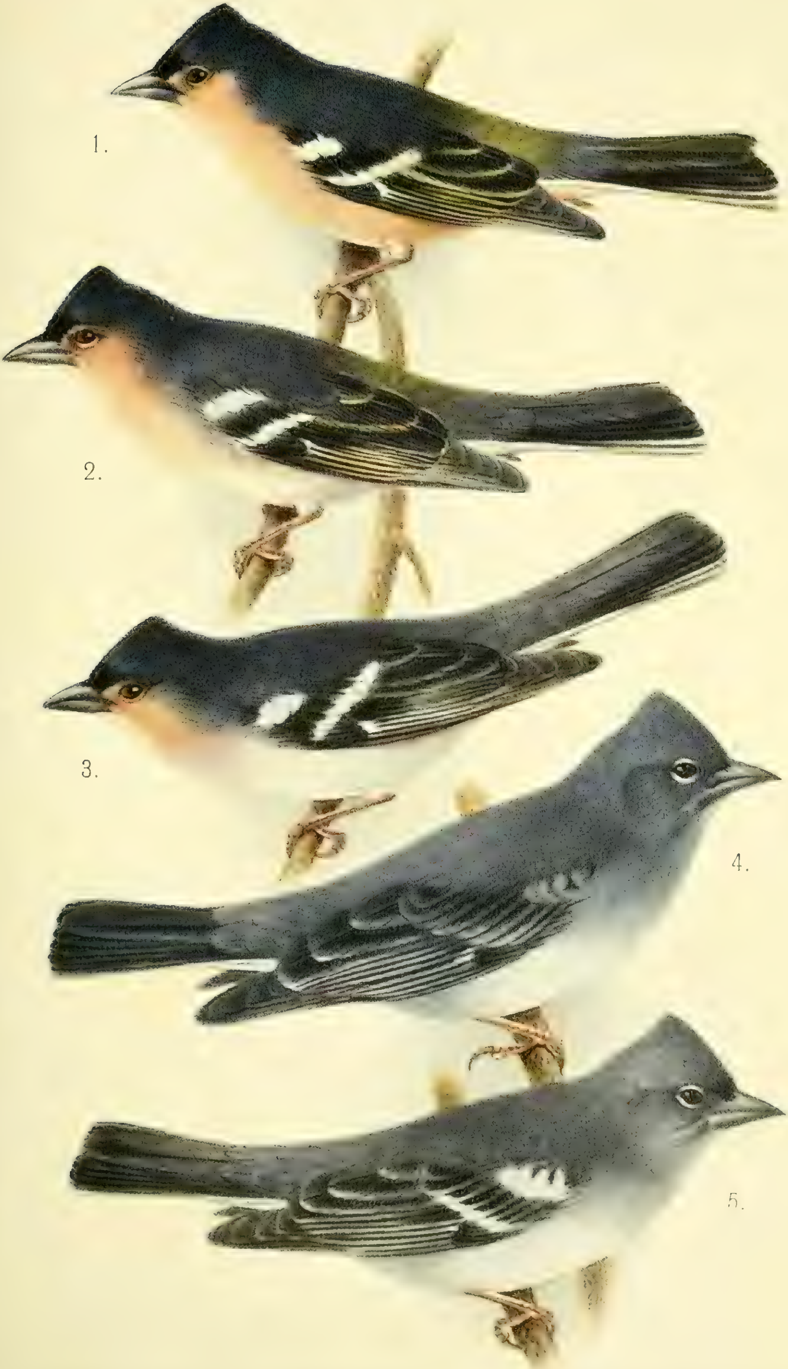
The fact that many of the birds of the same species in the Canaries are differently modified, although the islands are all within sight of one another, requires more explanation than is at first apparent. Undoubtedly the difference in the physical conditions, which I have shown to exist between islands of the eastern group and those of the western group, is sufficient to explain the distinctive characters in the birds inhabiting the two groups. The Brown Linnet, Short-toed Lark, Blue Titmouse, Chiffchaff, Barn Owl, Kestrel, and Thick-knee are all subspecifically distinct in the eastern group from the corresponding race in the western islands; those from the eastern group show in their plumage or structure characters which have undoubtedly been brought out by the desert-like conditions appertaining in the eastern Canary Islands.

But the islands of the western group, perhaps excepting Hierro, are fairly similar in climate and in their geographical nature to one another. Why, then, are the Titmice and Chaffinches (I do not here refer to the Blue Chaffinches) so distributed in the five islands of the western group? It has been remarked elsewhere that the distribution is similar in each case.

This state of things points to the Tits and the Chaffinches having arrived in a single immigration in the islands of Tenerife, Gomera, and Gran Canaria, where identical forms of both Tit and Chaffinch are found. The islands of Palma and Hierro would then have received their Chaffinch and Titmouse (distinct forms of each bird being found in both islands) at widely separated periods, and in the case of the Tits the immigration has extended to Fuerteventura and Lanzarote, where still another race has been formed.

Had the Titmice and Chaffinches spread over all the islands of the Archipelago in a single immigration, we should doubtless have found that if differentiation had taken place, only one form existed, at any rate in the western islands; but the movement having been gradual (*i. e.*, having taken place at widely separated periods) the birds have met with fresh organisms in the different islands where they have gained a footing. They have thus been influenced by the various factors with which they have come in contact, those factors having themselves altered considerably through lapse of time.

Instances of the case just mentioned are afforded by those species which are peculiar to the Archipelago, and which are universally distributed amongst the islands, but of which there exists only one race respectively in all the Archipelago. The Canarian birds in point are *Anthus bertheloti bertheloti*, *Sylvia melanocephala leucogastra*, *Emberiza calandra thanneri*, *Buteo buteo insularum*, and *Columba livia canariensis*. Darwin's explanation of this fact would have been that these species emigrated in a body, so that



1. FRINGILLA CŒLEBS CANARIENSIS. 2. FRINGILLA CŒLEBS OMBRIOSA.
3. FRINGILLA CŒLEBS PALMÆ. 4. FRINGILLA TEYDEA TEYDEA.
5. FRINGILLA TEYDEA POLATZEKI.

their relations were not much disturbed, and that if variation took place this would have been all in the same direction.

The fact that neither the Courser of the Canaries nor the Sand-Grouse has become modified in any way may be attributed to the almost identical conditions which exist between the continental and island homes of these birds, although we might reasonably have expected the island forms to have become darker, as the Bustard has done. Possibly migration to the mainland takes place, but we have no proof of this in either case.

The fact that the Osprey is similar to the continental form is easily understood, for it can hardly be termed isolated in the Archipelago, and being a coast-frequenting species would not meet with an environment much altered from continental conditions.

Similarly, none of the birds which I have termed Partial Residents in the Canary Islands have become differentiated, the frequent arrival of unmodified migrants from the mainland with which they interbreed being sufficient to keep up the continental strain. The Hoopoes, however, are making a great fight to establish themselves as an island race.

Isolation is one of the strongest factors—if not the strongest factor—to be reckoned with in the differentiation of a species. Once a bird is isolated and cut off from the stock from which it sprang, whether of continental or insular origin, it can no longer keep up the old strain ; and unless all the new conditions are exactly similar to those which it has left, the bird begins to develop along its own lines, influenced by the changed environment in which it finds itself.

In the Canary Islands most of the birds are completely isolated and many are confined to this Archipelago, where perfectly distinct geographical races have been formed ; but in one or two cases where insular races have been recognised, this isolation is not complete. The Resident Canarian Quail (*Coturnix c. confisa*) occasionally interbreeds with the Migratory Quail, which visits and breeds in the

Archipelago. The island Blackcap (*Sylvia atricapilla obscura*) probably occasionally interbreeds with the typical European species, which passes regularly through the islands on migration. If these visitors to the island sometimes interbreed with the residents, and we can hardly believe that they do not, then the purity of the island races is not kept up and intermediate forms are found. As this is probably the case with the Blackcaps, at any rate, it may explain why some systematists prefer to unite the Canarian Blackcaps with the typical race on the ground that complete intergradation exists.

The case of the Canarian Chiffchaffs (*P. c. canariensis* and *P. c. exsul*) is rather different; these two forms are so distinct that the European Chiffchaffs (*P. collybita collybita*), which pass regularly through the Archipelago on migration, do not appear ever to interbreed with them.

In a group of islands such as the Canaries we must remember that **Altitude** plays its part, if only a small part, in its bearing on the bird-life. It was long ago noticed that the Quails inhabiting the higher ground in the Canaries were of a darker and richer coloration than those in the lowlands, and it has now been established that this highland Quail is a distinct subspecies—resident in the Canaries and in the highlands of Madeira—*Coturnix coturnix confisa.*

In 'The Ibis,' 1914, pp. 240–243 and again in this paper (Part I., pp. 107–109) I have drawn attention to the curious fact that Corn Buntings living in the high lands of Gran Canaria (above 1500 feet), known as *Emberiza calandra thanneri*, are darker than the Corn Buntings which I shot on the coast, as can be verified by examining the skins I obtained, in the National Collection.

If the island of Tenerife, which rises above 12,000 feet, had been clothed with tropical vegetation we should find the **Zones of Vegetation** more pronounced than they are at present, and this would undoubtedly have influenced the bird population more than is now evident, witness the remarkable avifauna to be found on the Cameroon Mountain, 13,353 feet (*cf.* Ibis, 1915, pp. 473–526).

Whether altitude is indirectly responsible for the Blue Chaffinch (*Fringilla teydea teydea*) and the Woodpecker (*Dryobates major canariensis*), which inhabit the pine forests of Tenerife at an altitude of from 4000 to 6000 feet, differing in minute but perfectly distinct points from the corresponding subspecies *Fringilla teydea polatzeki* and *Dryobates major thanneri* inhabiting the pine forest of Gran Canaria, which are found at a lower altitude of from 3000 to 4000 feet, it is beyond my power to say. The pine forests of Tenerife, through more often being in heavy cloud than the Pinar of Gran Canaria, are probably damper than those in the latter island, but of the two forms the Gran Canarian race is decidedly duller in general colouring than the clear blue Tenerifian bird, and this brings us to the striking effect which **Climate** and **Light** can have on, at any rate, the plumage of a bird.

That Quails are affected to a very marked extent by the degree of moisture in the atmosphere was instanced at a former meeting of the British Ornithologists' Club, when it was shown by Mr. Ogilvie-Grant that in a large series of Bustard Quails, ranging from India to the Loo Choo Islands, the amount of rainfall in the various districts could be fairly accurately estimated from the colour of the plumage of the Quails. It is undoubtedly the dry desert climate of Fuerteventura and Lanzarote which is responsible for the pale plumaged birds found in those islands, of which a list has already been given.

The air in these islands is remarkably clear, the light extremely bright, and as Colonel Meinertzhagen remarks in his thoughtful paper on "Geographical Distribution and Migration" (Ibis, 1919, pp. 379–392), from observations in Palestine and elsewhere, "a high temperature, a dry atmosphere, and a bright light seem to produce that bleached effect usual in desert forms." What better instance of this can be quoted than that of the Fuerteventuran and Lanzarote Titmouse (*Parus cæruleus degener*), see Plate XV. fig. 1, when compared with the Titmice inhabiting the higher, moister, and more verdant islands of the western Canaries, *Parus c. teneriffæ* (Plate XV. fig. 2), *Parus c. ombriosus* (Plate XV. fig. 4), and *Parus c. palmensis* (Plate XV. fig. 3).

Can it be the brighter reflected light from the snows of the Peak of Tenerife which has affected the plumage of *Fringilla teydea teydea* and so caused it to be brighter than the Gran Canarian Blue Chaffinch living in the Pinar Pajonal, where the light may be slightly less bright?

The daily **search for food** is more likely to cause structural differentiation than any other factor which we can name. The Barn Owl of the eastern islands (*Tyto alba gracilirostris*) is structurally modified by having a long slender bill, so as more easily to obtain its food among the holes of the lava rocks, for it lives chiefly on lizards. This is a fairly obvious change which has taken place in the bird to aid it in its struggle for existence, for the western Canarian Barn Owl has many more opportunities of feeding on mice and beetles than the allied form we have been considering, and is therefore unmodified in this respect. Doubtless there are other less obvious instances in the avifauna of the Canaries, the birds of which tend to possess stronger tarsi and longer bills than their Continental allies, though this character is not always constant.

The presence of enemies in an island has already been mentioned, and this leads to the need of **Protective Resemblance** and possible requirement of **Mimicry** for purposes of aggression; the two expressions "protective resemblance" and "mimicry" must not be confused. There are no instances of mimicry among the birds of the Canary Islands, and indeed it is very rare among all birds, being confined almost entirely to the Cuckoos, of which there is no resident form in the Archipelago.

Protective Resemblance, on the other hand, is well illustrated. We need only instance the Rock-Sparrow, the Courser, the Sand-Grouse, the Quail, and the Bustard, although the instances in the Canarian avifauna could be greatly multiplied, especially among the young of many species. Of the cases cited the Bustard is the most instructive, obviously descended from the Houbara Bustard of North-West Africa;

the Canarian form has in a previous epoch crossed from a home among the sandy wastes of Africa, and finding itself in an island (Fuerteventura) geologically different from the Saharan deserts has become modified in just such a way as best to afford it protection from its enemies by the remarkable resemblance of its plumage to the ground on which it lives; for the back of the island bird has become darker than that of the Continental form, thereby being less conspicuous among the lava rocks, with which the Fuerteventuran plains are scattered, than would otherwise have been the case. The Fuerteventuran Bustard is now regarded as a perfectly distinct geographical race and has been named *Chlamydotis undulata fuerteventuræ.*

In this connexion it is interesting to note that in the eastern Canary Islands, where the reefs which are found on many parts of the coast are formed of black water-worn lava, the Oystercatcher is black in plumage, and were it not for its red bill—which must serve some purpose to aid it in its search for food—would be most inconspicuous.

Variation, then, is *commenced* in a species by any one of the factors which we have been discussing, or more probably by a combination of most or all of them. It is obviously impossible to say which has had the greatest influence on the island birds that are the subject of this paper. Many of them are only very slightly modified, as, for instance, the Trumpeter Bullfinch, Least Goldfinch, Madeiran Rock-Sparrow, Kœnig's Shrike, Spectacled Warbler, etc., etc. The variation having once started it is maintained by natural selection—that process whereby certain of the same species are more or less rapidly eliminated while others are able to survive and thrive. This is the natural outcome of the struggle for existence; only a certain number of birds can exist in an island such as Hierro or Lanzarote, if they continually keep on increasing: finally, there must be a scarcity of food—particularly in desert islands,—the birds fight for the food amongst themselves, the fittest survive, the weakest perish. Thus the progressive modification of species by the agency of variation and natural selection which we term evolution continues—new geographical forms arise, and the laws of heredity complete the process.

Affinities of Canarian Avifauna.

The affinities of the Resident birds of the Archipelago of the present day were discussed by Dr. Hartert in 1901 (Nov. Zool. vol. ix. pp. 304–312), who came to the conclusion that they were chiefly European in character, and he therefore included the fauna of the islands in the Palæarctic Region, and has discussed the forms in his valuable 'Vögel Paläarktischen Fauna'; the opinion which he formed then was absolutely correct, and recent investigation of the migratory species helps to strengthen this view.

To deal first with the 61 Resident species, my own opinion is as follows:—I consider that 41 are most nearly allied to forms found to-day in northern Europe, and, as will be seen by referring to the list on page 520, are all closely related to forms inhabiting the British Islands; then of the remainder 8 are either south European forms or closely allied to species inhabiting the Mediterranean sub-region. With these I include *Erythrospiza g. amantium, Petronia p. madeirensis, Passer h. hispaniolensis, Calandrella minor polatzeki,* and *C. m. rufescens, Sylvia melanocephala leucogastra, Sylvia conspicillata bella, Caccabis petrosa kœnigi.*

Three species I consider to be more truly north African than European, *i. e., Chlamydotis undulata fuerteventuræ, Cursorius g. gallicus,* and *Pterocles orientalis*; while of birds whose nearest relatives can only be considered African there are but two, *Neophron p. percnopterus* and *Hæmatopus niger meadewaldoi.* Of these two the Oystercatcher belongs to a cosmopolitan genus widely represented in Europe, but of which the black species are not found in the Palæarctic region. There are, however, 7 other Resident birds in the Canaries confined to these islands of which it is more difficult to trace the immediate affinities: these are *Fringilla teydea teydea* and *F. t. polatzeki, Anthus bertheloti bertheloti, Saxicola dacotiæ dacotiæ* and *S. d.*

murielæ, *Columba junoniæ*, and *Columba bollei*. All (except the first two mentioned) belong to genera of wide distribution, and of the 5 species here represented *Fringilla teydea* is probably of most ancient origin. No bird which we can consider to be closely allied to the Blue Chaffinches of the Canary Islands is to be found anywhere in the world, but the family Fringillidæ, to which they belong, is, of course, typically Palæarctic, we might almost say European. In bygone days a Blue Chaffinch may have lived in the extensive forests which clothed the mountains of southern Europe, and the ancient pine forests of the Atlas Mountains may have held the last representatives of this remarkable bird, from which the now unique island races have sprung.

Indeed, I have always cherished the idea that a thorough investigation of the Ornis of the Southern-Atlas Mountains and the country lying to the south of this range might throw some light on the origin of certain of the resident birds in the Canaries. The recent interesting discovery in Morocco of a Nuthatch by Captain Lynes, R.N., lends colour to my theory *. For the present we must include the Blue Chaffinches as having their affinities rather with Europe than with any other part of the world.

The Pipit and the Chats I believe to have been descended from species of northern Africa; indeed I should not be surprised to find a Chat closely allied to *Saxicola dacotiæ* inhabiting the unexplored coasts of the continent which lie opposite the Canary Archipelago.

The two Pigeons (a third remarkable form, *Columba trocaz*, inhabits Madeira), must have been isolated in their island homes for many centuries, so specialized have they become and so distinct from all other races of Pigeons known in Europe or Africa. With the Blue Chaffinches their original home must remain a mystery, but whereas the genus *Fringilla* is typically Palæarctic the genus *Columba* is cosmopolitan. It would be useless, therefore, to speculate as to where their nearest allies may be found at the present day, or whether they are the direct descendants of European or African stock.

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* Since this paper was written I have received the January 'Ibis' containing the highly valuable paper by Captain Lynes on his explorations in the Atlas Range. I regret that owing to absence abroad my paper had to be printed before I had read Captain Lynes's conclusions. I have therefore not made the use of them which I should otherwise have done.—D. A. B., Gran Canaria, February 1920.

In dealing with the affinities of an insular fauna, it is, of course, the *endemic forms* which throw most light upon the subject. It is of much less importance to study those birds which still have connexion with a continent; but, nevertheless, certain lessons can be learned by a critical review of the Birds of Passage and Visitors.

Before passing on to the Birds of Passage let us see whether the Partial Residents can upset the conclusions at which we have arrived. I might have included the Partial Residents with the Residents, but perhaps, as they still have connexion with a continent, they are best dealt with separately. Only five in number, the Hoopoe, the Heron, and the Kentish Plover are all Palæarctic birds with an enormous range, the Peregrine belongs to a north African race and is closely allied to our European bird, while the Herring-Gull is the Mediterranean race and allied to the Gull which breeds on our own coasts in England.

We note, therefore, that the Partial Residents all appear to be of European origin.

Of the Summer Visitors the Pale Swift is a north African species, but as representative races are found in southern Dalmatia it is best considered as belonging to the Mediterranean sub-region.

The Black Swift is not found in Europe, its true home being the Atlantic islands, representative races being found in the Cape Verde Islands and in Fernando Po.

The Eleonore Falcon is a Mediterranean bird.

The Common Tern and the Migratory Quail are both the well-known European birds, while the Turtle Dove is obviously of European origin if not the identical bird.

Puffinus k. fortunatus is a race of *P. kuhli,* geographical forms of which range from the Mediterranean to the Cape Seas.

More interesting are the affinities of the other Shearwater and Petrel. *P. a. baroli* is represented by allied forms in several widely separated localities in the Pacific and Indian Oceans, but is the only form known to occur in the Atlantic, where it is isolated in the Archipelagos from the Azores to the Canaries.

Bulweria bulweri bulweri enjoys the same distribution in the Atlantic as the Madeiran Allied Shearwater. In the Pacific the allied races known are confined to the Hawaiian and Bonin Islands—another interesting case of discontinuous distribution.

These last two cases have been more fully discussed on pp. 543-544.

The 15 Winter Visitors without exception are all north European species—many having a wide range—especially the Ducks, the Waders, and the Coots.

The 33 Birds of Passage are likewise chiefly north European, but *Merops apiaster* and *Falco eleonoræ* belong more to the Mediterranean fauna. Of the Waders all are species with an extensive range which visit the Canaries on migration to and from their breeding-quarters in the far north of Europe and Asia.

The 5 Annual Visitors are all members of the Order Tubinares, with extensive distribution in the Atlantic and Pacific.

Amongst the 30 Occasional Visitors we find several south European and Mediterranean species, as, for instance, the Golden Oriole, Rock-Martin, Lesser Cuckoo, Roller, White Stork, and Marbled Duck ; the remainder are north European birds, the Waders breeding also in northern Asia.

We have now only to consider the Rare Visitors, and here it will be noticed that the south European forms increase in number and African species occur—a state of things which we can easily understand.

Of the 72 species and subspecies which come under this category

45 are well-known European species.

5 are central European species, *i. e.*, the West European Jackdaw, White-eyed Pochard, Little Bittern, Night Heron, and Black-necked Grebe.

10 are south European species, *i. e.*, the Snow Finch, Southern Tree-Warbler, Great Spotted Cuckoo*, Alpine Swift, Persian Bee-eater, Flamingo*, Purple Heron*, Great White Heron, Little Egret*, and Buff-backed Heron*. (Those birds marked with an asterisk are also found throughout Africa.)

4 belong to the Mediterranean countries, *i. e.*, the Sardinian Starling, Golden-bellied Greenfinch, Calandra Lark, and Western Black-eared Wheatear.

4 are typically north African birds, *i. e.*, the Saharan Bunting, Tristram's Desert Wheatear, the Egyptian Plover, and North African Turtle-Dove.

2 birds are confined principally to Africa, *i. e.*, the Squacco Heron (which is also a Summer Visitor to southern Europe), and Sturm's Bittern, which is confined to Africa.

1 bird—the Madeiran Fork-tailed Petrel—inhabits all the Atlantic Archipelagos with the one exception of the Canaries, and even breeds in St. Helena. In the Pacific a closely-allied form of this Petrel occurs in the Hawaiian and Galapagos Archipelagos.

1 bird—the American Bittern—has its home in northern America and winters in central America. It is an Occasional Visitor to Europe, and has occurred in the Azores.

The figures speak for themselves, and the close European relationship of the Canarian Avifauna—both as regards its Resident species, Regular Migrants, and Accidental Visitors—needs no further elaborating. I unhesitatingly endorse Dr. Hartert's decision (made, be it remembered, nearly twenty years ago, when we had much less material to guide us) to include the Canary Archipelago in the Palæarctic Region.

Connexion between the Birds of the Canaries and the other Atlantic Archipelagos.

The connexion between the birds of the North Atlantic islands can only be kept up by the migratory species. Communication of the Resident Birds has, I believe, long ceased to exist, except, perhaps, in one or two doubtful cases, such as the Woodcock and the Courser—the migratory movements of which, if they take place at all, are quite unknown. It must be borne in mind, however, that Woodcocks are found in some numbers in the Azores as well as in the Canary Islands, and that the Courser is found in the Cape Verde Islands as well as in the Canaries, and that those birds inhabiting the one group of islands are not in any way distinguishable from those inhabiting the other group or from the typical Continental forms.

The Azores lie so far out of the line of flight of migrating birds that these islands can hardly be considered in this connexion, but it is worth noting how Guppy, when working out the affinities of the Azorean flora, regarded the connexion between the plants of the woods of the Azores and the Canaries as kept up. This he attributed to the activities in recent times of frugivorous birds—a conclusion which points, in Guppy's opinion, to the intercommunication between the Azores and Canaries of fruit-eating species—in my opinion more probably of ground-nesting species, such as the Woodcock and Quail, for it is well known how such birds carry the seeds of plants on the mud or earth which becomes attached to the feet or tarsi, or even to the feathers.

The Resident birds common to the Azores and Canaries are only four in number: the Least Goldfinch, the Canary, an aberrant Blackcap, and the Woodcock already mentioned, but these show, particularly the Canary and Blackcap, that at one time there must have been some connexion between the birds of these two groups. The Buzzard of the Azores can no longer be allied with the Canarian race, although I united them in an earlier Part of this List, and I am sure that the Buzzard* of the Cape Verde Archipelago is now distinguishable, but this form I kept distinct when dealing with Buzzards in my List (Part iii., Ibis, 1919, p. 482). Guppy drew attention to the fact that the plants in the woods of the Atlantic islands shewed specific and varietal differentiation and that this divergence corresponded with the specific and subspecific differentiation of the pigeons of the genus *Columba* inhabiting these islands.

A much closer bond exists between the avifauna of Madeira and of the Canaries. Here we find there are eleven Resident birds which are found in both groups: the Least Goldfinch, Canary, Madeiran Rock-Sparrow, Dusky and Heinecken's Blackcaps, Madeiran Spectacled Warbler, Cabrera's Blackbird, Madeiran Redbreast, Canarian Kestrel, Woodcock, and Madeiran Quail. An additional link, which is now severed, is to be found in a race of Berthelot's Pipit, *Anthus bertheloti madeirensis*, inhabiting Madeira and Porto Santo, while the typical and only allied form inhabits the Canaries.

Undoubtedly the majority of the species which are included in my list of the Birds of Passage of the Canaries occur similarly in the islands of Madeira, Porto Santo, and the Salvages. I have not closely compared Padre Schmitz's List of the Migratory Birds of Madeira, but have little doubt that all occur there also and thus form a link between the Archipelagos.

The Cape Verde Archipelago has very few connecting links with the Canaries, the only Resident birds common to both being the Spanish Sparrow, Madeiran Spectacled

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* Since the above was written Mr. Kirke Swann has named the Azores Buzzard *Buteo b. rothschildi*, the Madeiran Buzzard *B. b. harterti*, and the Cape Verde Islands Buzzard *B. b. bannermani* [Syn. List of Accipitres, Part ii. 1919, pp. 43, 44].

Warbler, Egyptian Vulture, Osprey, Courser, and Migratory Quail. Ethiopian types prevail in the Cape Verde Islands, as is only to be expected, and this Archipelago cannot by any stretch of imagination be included in the Palæarctic region.

The curious distribution of the Shearwaters and Petrels in the Atlantic islands was the subject of a paper which I published in 'The Ibis' in 1914, pp. 438–494, and I then pointed out that although the same species were in certain cases found breeding in islands as widely separated as the Cape Verdes and the Azores, yet this did not necessarily indicate that the birds from one colony had any connexion with the birds of other breeding stations. The fact that in the Cape Verde Islands is found a form of *Puffinus kuhli* [*P. k. edwardsi*] perfectly distinct from the race inhabiting the more northern Archipelagos, strengthens this view, as also does the fact that *Oceanodroma castro castro* breeds in all the North Atlantic islands *except* the Canaries, which islands lie in the centre of its breeding range and form the missing link in an otherwise connected chain of Atlantic breeding stations. There are other instances, but these will suffice to emphasize my point.

The Birds of Passage.

In the J. f. O. 1890, Kœnig makes the astounding statement "I declare plainly that the Canaries are visited quite by chance by Palæarctic birds on their flight, and that there can be no question of regular appearances of migratory birds there"! The inaccuracy of this remark is obvious to anyone who has passed even one spring and one autumn in the islands.

No fewer than 33 Palæarctic species pass *regularly* through the Canaries in spring and autumn (probably a great many more). These are the birds which follow the coast of Spain and Portugal and take the extreme westerly course passing far out to sea *via* Madeira, the Salvages, and the

Canaries, possibly touching the continent again near Cape Blanco. This is, of course, a hypothetical line, but it is well known that migrating birds have a strong tendency to follow an extended coast-line. Moreover, birds passing from Spain and northern Africa (where food is plentiful) to tropical Africa, if they do not hug the coast, find they have to pass through the most inhospitable land of the Great Sahara *, where food is scarce over a very large area. It follows, then, that the birds passing in autumn from north to south have a reason to stick to the African coast-line, and as they cannot possibly see the land at night, many pass over the sea and use the islands of the Madeira and Canary groups as halting places where they can rest awhile and secure plenty of food with very little trouble.

The "front" upon which this great migratory advance is made is a very wide one—the Canary Islands being at the extreme westerly end, and, as I have tried to shew, would certainly not have so many migrants passing through them were it not for the proximity of the African shores. Farther to the east hundreds of birds must follow the Nile Valley, while again countless numbers pass down the eastern shores of the continent. Dr. Hartert's interesting remarks on Bird Migration in Algeria (Nov. Zool. xx. 1913, pp. 73–76) strongly support the theory of coastal migration. In this article the writer seems to suggest that the Canaries are visited through the migrants following the west European shores, which have a south-westerly direction, and, maintaining this direction during their flight, the birds pass out to sea and eventually come to the Canary Archipelago. That the birds which pass through the Canary Islands come again to the mainland, and do not all perish at sea, is surely proved by the regularity with which many species occur there on migration, shewing to my mind that this is the most western extreme of the *regular* flight and that the occurrence of the migratory species in these islands is not by any means a matter of chance alone.

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* That, nevertheless, large numbers of migratory birds pass over the Sahara itself is well known. At the migration season the oases of the Sahara are teeming with bird-life while at other times of the year they are practically deserted.

To convince ourselves that the Canary Islands have for centuries been in the direct flight of migratory birds we have only to glance down the list of the Resident species (non-migratory at the present day). Among these we see certain birds which with hardly any doubt got a footing in the islands when the species (not necessarily the geographical race into which some have now evolved) passed on its regular flight through the islands: the Chiffchaff, Warblers, Kestrels, Woodcock, and Madeiran Quail come to mind as typical examples, most of which have now entirely ceased to migrate, and all of which, save the Woodcock, have become differentiated to a lesser or greater extent.

In Dr. Lowe's fascinating book 'A Naturalist on Desert Islands' (p. 48) the question is asked, "How came these birds to drop their migratory habit? Did the climate and the conditions generally, in the Canaries, gradually come to fulfil exactly throughout the whole year the requirements of the Chiffchaff, and so gradually do away with the necessity for periodical migration? Under these conditions we can conceive that those birds which did return annually to Europe in the spring would gradually become fewer and fewer, until at length there would be none left, and this migratory branch-route north to south or south to north would cease to exist, and the Canary Island birds would be cut off from any autumnal influx of birds which had bred in the north, and would be completely isolated." In a later chapter Dr. Lowe remarks: "Isolation, of itself alone, does not seem capable of producing fresh varieties any more than segregation. Natural selection is only the final arbiter in determining what variations shall survive, *after* they have been produced by the influence of external conditions. If the external conditions are the same all the world over, natural selection cannot come into action."

The same thing is going on to-day: witness those species which I consider Partial Residents and which have not yet entirely dispensed with the migratory habit; such are the

Hoopoe, Barbary Falcon, Heron, Kentish Plover, and Yellow-legged Herring Gull in the Canary Archipelago. We must not forget that (as mentioned by Meinertzhagen) it is probably the environment of the breeding quarters which chiefly influences differentiation.

Yet again we have numerous other migrants, some arriving in the summer, some in the winter, while the largest list of all the general visitors contains the Birds of Passage passing to and fro regularly twice a year. In a hundred years time how many of these true Birds of Passage which now pass *through* the islands will have remained to breed, ceased to pass beyond the Archipelago, and become resident and in their turn differentiated? The birds peculiar to the Canary Islands will, I am convinced, increase in numbers as the years go on.

Although I maintain that many of the Passerine species got a footing in the Canary Islands in the first instance through the agency of regular migration, yet, as Colonel Meinertzhagen has recently emphasized, there are various types of migration which he groups under the headings of "periodic" and "regular" migration, "sporadic invasion" or "extensive wanderings," discussed at greater length by Seebohm in his 'Geographical Distribution of the Charadriidæ.' Certain birds of the Canaries may well have arrived through the agency of the movements here noted. It is more than likely, for instance, that both the Sand-Grouse and the Courser arrived in the eastern islands during a sudden invasion (immigration), for neither is differentiated in the slightest degree. The Great Spotted Woodpeckers have, on the contrary, in past years gradually extended their range south until they reached the Canaries; their course can be plainly followed through southern Spain, the Mediterranean islands, and Morocco (in all of which places local races have been formed), until finally they crossed the sea and formed the two races which now inhabit Tenerife and Gran Canaria. Amongst other examples sprung from European stock whose southern range ceases in the Canary Islands, are the Raven, Chough, Goldfinch, Rock-

Sparrow, Chaffinches (of the *F. cœlebs* group), Linnet, Corn Bunting, Titmice, etc. The list could be increased of those residents which have probably never passed south beyond the latitude of the Canary Archipelago.

The remarkable fact that we have in the Canaries a *Black* Oystercatcher may possibly be put down to the same cause. Its nearest ally is an inhabitant of South Africa, but does not now extend farther north than Damaraland on the West Coast. Either the bird has gradually pushed farther and farther north until its present home was reached, or it once lived commonly in these latitudes and for some reason has been slowly pushed southwards down the coast of West Africa, leaving no trace save the fast disappearing subspecies; for it has become markedly differentiated, isolated in the desert islands of the eastern Canary group. I lean to the former explanation of its presence there, otherwise surely we should find other races in the islands or on the mainland between the Canaries and the habitat of its nearest ally. The lessons to be learnt from studying this bird alone are typical of what may be gleaned when the avifauna of a whole Archipelago is under examination.

Only migration from the continent to the islands and *vice versa* has been discussed here. That a certain amount of local migration takes place in the islands themselves (not *between* the islands) seems evident, caused by local weather conditions or even influenced by human agency.

Meade-Waldo (Ibis, 1889, p. 2) speaks of the immigration of the Blackbird (*Turdus merula cabreræ*) in Tenerife from the lowlands to the highlands of that island. Curiously enough they "swarmed in the high forests during the winter," when one would imagine they would seek the warmer zone of the coast. The same observer notes that large numbers of Canaries ascend to the high mountain woods to breed, going up about the end of April. Apparently they returned to the lowland valleys after breeding.

Von Thanner remarks that it is quite the exception to find a Hoopoe in the higher districts of Gran Canaria and Tenerife during the winter, though he has found them breeding at this time of year on the coast. To human agency may be put down the migration (if not the extermination) of *Columba bollei* from Gran Canaria by the destruction of the laurel forests, a sad fact which has already been chronicled earlier in this paper. The drying up of the lake at Laguna has enormously influenced the migrations of the duck family; while the reclaiming of the Laguna plateau, once much more of a "swamp" than can possibly be imagined now, has had the same effect on the Rails and Herons and other marsh-loving species.

If the pine forests of Tenerife and Gran Canaria suffer the same fate as the laurel in Gran Canaria we shall either see the total extermination of the beautiful Blue Chaffinches, not to speak of the Woodpeckers, or else happily their migration to the island of Palma, where the pines are in less danger of total destruction.

Should the evergreen forests of the Canaries be destroyed in generations to come through short-sighted human agency, then the climate of these islands will itself change remarkably, and who can tell what disastrous effects this may have on the bird population. Birds which have lived for centuries in the islands may then be compelled to migrate, faced by the destruction of their favourite food, nesting-sites, or even cover itself.

I have hardly alluded to intermigration between the actual islands which make up the Canary Archipelago. Evidence in favour of this taking place is extremely scanty, and although certain islands—notably Fuerteventura and Lanzarote, Tenerife and Gomera—are situated very close to one another, yet it is remarkable what little communication appears to take place between them. We know that the Bustard very seldom passes from Fuerteventura to Lanzarote, and even more rarely crosses to the south-eastern plains of Gran Canaria, where, however, the Courser is now a breeding bird, as it is in the south of Tenerife: obviously, with the Trumpeter Bullfinch, it has extended its range from the eastern islands.

The Sand-Grouse has likewise been known to occur in

Gran Canaria from its true home in Fuerteventura. The Courser and the Sand-Grouse are both birds of powerful flight, and it is not surprising that they should move about. I am inclined to think that when Sand-Grouse appear in Gran Canaria (it is now many years since they have been recorded) they make the journey in search of water. For at times so severe a drought is experienced in Fuerteventura that men and animals have to be transported to Gran Canaria to prevent the latter dying of thirst. This may have accounted for the Courser's starting colonies in Gran Canaria and Tenerife, which islands are never so badly off for fresh water as those of the eastern group.

The Corn Bunting is said by Polatzek (Orn. Jahrb. 1908, p. 196) to be a Summer Visitor to Fuerteventura and Lanzarote, arriving in February, breeding in March and April, and leaving after the harvest to return again in the spring. Whether this bird comes from the other islands or from the continent is difficult to prove, and it is undoubtedly very locally distributed in the eastern islands in the summer time, as I have proved for myself. Certainly the only bird I procured there in the summer belonged to the dark-breasted race which, if recognised as distinct, is apparently confined to the Canary Archipelago.

The case of the Chat (*Saxicola dacotiæ murielæ*) must be cited as a last instance, though the possibility of this race occurring also on the mainland of Africa must not be lost sight of. A small flock of these birds was discovered on the tiny islet of Montaña Clara two days after I landed there in June 1913. Four or five birds were seen and two secured, the others dispersed, and although I spent eight days on this island, and there was very little cover, I never saw a single Chat again. On the small island of Allegranza, not far distant, these birds were fairly common. Doubtless my three individuals migrated to this island when so rudely disturbed. They are restricted to these two outlying islets, having been found nowhere else in the Archipelago.

We know, of course, that birds occasionally pass from Lanzarote across the narrow strait which divides it from Graciosa. I have myself watched a Thick-knee flying to the former island from Graciosa, although at the time this very bird was breeding close to my camp. The distance is infinitesimal and cannot be taken into consideration.

Between the seven large islands it seems evident that remarkably little migration takes place of those birds which we include amongst the list of Residents. Of those, however, which have been known to migrate from one island to another within recent years, we must confess to almost complete ignorance. The cases cited (with the possible exception of the Corn Bunting) belong rather to chance migration brought about by exceptional circumstances than to a regular seasonal flight from one island to another.

Lastly, if any readers of this paper should find themselves in the Canary Islands with time on their hands, may I beg them to turn their attention to some of those problems which are still unsolved, a few of which I have but lightly touched upon in the course of my paper. In particular would the study of migration repay the observer. The island of Allegranza would be an ideal "Heligoland," and our knowledge of this fascinating branch of ornithology would, I confidently predict, be increased beyond all expectations.

In the preceding pages I have attempted to describe some of the engrossing problems which the Canaries present—to give to the readers of 'The Ibis' something beyond the "bare lists" of which complaint is so often made. In this "Part" I have attempted to atone for publishing "A List of the Birds of the Canary Islands," and more especially for having taken up so much valuable space in seven consecutive numbers of our Journal, a crime which weighs heavily on my conscience and for which I here apologise.

Finally, lest we forget! I should like to endorse very strongly the statement made by Lieut.-Col. Meinertzhagen in his essay on "Geographical Distribution and Migration," that "*no killing of birds can be justified merely to compile a list of species obtained in a certain locality.*" A sounder statement was never made. Far too much attention is given to the mere amassing of skins—undoubtedly (I would remind some biologists) the means to the end, but not the end in itself. Nine-tenths of the value of a collection of birds is to be found in the *deductions* which we can make from it, but it must not be overlooked that without the incomparable material, such as that contained in the British and Tring Museums, such deductions could never be made, and the great Principles built up by such men as Darwin, Wallace, and P. L. Sclater upon which Zoology is based could never have been formulated.

[Concluded.]

XXI.—*A Nominal List of the Birds at present known to inhabit Siam.* By Count NILS GYLDENSTOLPE, D.Sc., F.M.B.O.U.

[Continued from p. 496.]

Family CAMPOPHAGIDÆ.

Artamides sumatrensis S. Müll.

Ceblepyris sumatrensis S. Müller, Verhandl. Natuurl. Gesch., Land- en Volkenk. 1844, p. 190: Sumatra.

Recorded by Barton from Me Taw near Raheng, but identification most certainly wrong.

Graucalus macei siamensis Stuart Baker.

Graucalus macei siamensis Stuart Baker, Bull. Brit. Ornith. Club, xxxviii. 1918, p. 69.

The Siamese representative of the Large Cuckoo-Shrike has recently been separated by Stuart Baker under the above-mentioned name. It is fairly common in suitable localities throughout the whole country.

Volvocivora lugubris saturata Swinh.

Volvocivora saturata Swinhoe, Ibis, 1870, p. 242 : Hainan.

Only recorded from Koon Tan in northern Siam.

Volvocivora lugubris intermedia Hume.

Volvocivora intermedia Hume, Stray Feathers, v. 1877, p. 205 : Tenasserim.

Apparently an inhabitat of eastern Siam, where specimens have been collected at Lat Bua Kao and Pak Jong. *Volvocivora koratensis* Kloss (Ibis, 1918, p. 183) becomes a pure synonym to Hume's bird.

Volvocivora neglecta Hume.

Volvocivora neglecta Hume, Stray Feathers, v. 1877, p. 203 : S. Tenasserim.

Generally distributed throughout peninsular Siam and the neighbouring islands, though nowhere very common.

Pericrocotus cinereus cinereus Lafr.

Pericrocotus cinereus Lafresnaye, Rev. Zool. 1845, p. 94 : Luzon.

A winter visitor to Siam, where it has been found at Bangkok, Paknam, Koh Lak, Trang, and on the island of Puket.

Pericrocotus cinereus cantonensis Swinh.

Pericrocotus cantonensis Swinhoe, Ibis, 1861, p. 42 : Canton, China.

A single specimen of the Chinese race of the Ashy Minivet was obtained by the present author at Bang Hue Hom in northern Siam.

Pericrocotus peregrinus Linn.

Parus peregrinus Linnæus, Syst. Nat. Ed. xii. 1766, p. 342 : Java.

Not uncommon in northern and eastern Siam. Also recorded from Bangkok and Menam Kabren.

Pericrocotus solaris solaris Blyth.

Pericrocotus solaris Blyth, Journ. Asiat. Soc. Bengal, xv. 1846, p. 310 : Darjeeling.

Hitherto only recorded from Non Luum in eastern Siam by the present author.

Pericrocotus solaris griseigularis Gould.

Pericrocotus griseigularis Gould, P. Z. S. Lond. 1862, p. 282 : Formosa.

A few specimens have been collected at Koon Tan in northern Siam by the present author.

Pericrocotus igneus Blyth.

Pericrocotus igneus Blyth, Journ. Asiat. Soc. Bengal, xv. 1846, p. 309 : Malacca.

Recorded from Ban Kop Klap in the province of Bandon, peninsular Siam.

Pericrocotus speciosus speciosus Lath.

Turdus speciosus Latham, Ind. Orn. i. 1790, p. 363 : India.

The Indian Scarlet Minivet has recently been recorded from Sai Yoke in south-western Siam.

Pericrocotus speciosus fraterculus Swinh.

Pericrocotus fraterculus Swinhoe, Ibis, 1870, p. 244 : Hainan.

Rather common throughout northern Siam, where numbers of specimens have been collected. In eastern Siam it seems to be more rare, and it has also been obtained on the island of Puket.

Pericrocotus xanthogaster flammifer Hume.

Pericrocotus flammifer Hume, Stray Feathers, iii. 1875, p. 321 : Pakchan, S. Tenasserim.

Hitherto only obtained in peninsular Siam, where specimens have been collected at Trang and Koa Nawng.

Pericrocotus brevirostris Vig.

Muscipeta brevirostris Vigors, P. Z. S. Lond. 1831, p. 43 : Himalayas.

Recently obtained at Doi Nga Chang south of Lakorn Lampang in northern Siam.

Lalage nigra nigra Forster.

Turdus niger Forster, Indische Zool. 1781, p. 41 : India.

A southern form hitherto only recorded from the southern parts of peninsular Siam, where specimens have been collected at Bangnara and at Singora. Formerly known as *Lalage terat* Boddaert, but Forster's name has priority.

Family Muscicapidæ.

Hemichelidon ferruginea Hodgs.

Hemichelidon ferruginea Hodgson, P. Z. S. Lond. 1845, p. 32: Nepal.

Recorded from peninsular Siam and from Pulu Adang, one of the Butang Islands off the western coast of peninsular Siam.

Hemichelidon fuliginosa Hodgs.

Hemichelidon fuliginosa Hodgson, P. Z. S. Lond. 1845, p. 32: Nepal.

Hitherto only found in peninsular Siam, where specimens have been collected at Chong in Trang.

Alseonax latirostris latirostris Raffl.

Muscicapa latirostris Raffles, Trans. Linn. Soc. Lond. xiii. 1821, p. 312: Sumatra.

Apparently rather common in Siam during the winter months, as numerous specimens have been collected in various parts of the country.

Alseonax latirostris siamensis Gyld.

Alseonax siamensis Gyldenstolpe, Ornith. Monatsber. 1916, p. 27: Bang Hue Pong, N. Siam.

Hitherto only obtained at the type locality.

Siphia parva albicilla Pall.

Muscicapa albicilla Pallas, Zoogr. Rosso-Asiat. i. 1827, p. 462: Dauria.

A winter visitor to Siam. Specimens recorded from Bang Hue Hom and Den Chai in the north, from Lat Bua Kao in eastern, from Sriracha in south-eastern, and from Bangkok in central Siam.

Erythyromyias dumetoria muelleri Sharpe.

Erythromyias muelleri Sharpe, Cat. Birds Brit. Mus. iv. 1879, p. 200: Sumatra.

Up to the present time only recorded from Kao Nawng in the province of Bandon, peninsular Siam.

Gerygone griseus Gyld.

Gerygone griseus Gyldenstolpe, Ornith. Monatsber. 1916, p. 27 : Koh Lak, S.W. Siam.

Hitherto only obtained at the type locality. Robinson & Kloss (Ibis, 1918, p. 591) record a specimen from Pulu Panjang Anak near Puket under the name *Gerygone modiglianii*, but this specimen probably also belongs to the present form.

Xanthopygia narcissina xanthopygia A. Hay.

Muscicapa xanthopygia A. Hay, Madras Journ. Lit. Sci. xiii. pt. 2, 1845, p. 162 : Malacca.

Recorded from peninsular Siam during the winter months. Also obtained at Lat Bua Kao.

Hypothymis azurea styani Hartl.

Siphia styani Hartlaub, Abh. Nat. Ver. Bremen, xvi. pt. 2, 1898, p. 248 : Hainan.

Extremely common throughout Siam proper, being replaced in the south by the next species.

Hypothymis azurea prophata Oberh.

Hypothymis azurea prophata Oberholser, Proc. U.S. Nat. Mus. xxxix. 1911, p. 597 : Great Karimon Island.

Occurs throughout peninsular Siam, northwards at least to the latitude of Koh Lak, where this species has been obtained.

Cyanoptila cyanomelana Temm.

Muscicapa cyanomelana Temminck, Planches Col. Nr. 470, 1828 : Japan.

A winter visitor to Siam, and apparently very rare, as it has only been obtained on Pulu Terutau.

Poliomyias mugimaki Temm.

Muscicapa mugimaki Temminck, Planches Col. Nr. 577, fig. 2, 1835 : Japan.

Like the former species this is a winter visitor to Siam, where it has been met with on Pulu Terutau.

Rhinomyias pectoralis Salvad.

Alcippe pectoralis Salvadori, Atti R. Acc. Sci. di Torino, iii. 1868, p. 530 : Borneo.

Recently recorded from Bangnara in peninsular Siam.

Rhipidura javanica Sparrm.

Muscicapa javanica Sparrman, Mus. Carlsonianum, iii. 1789, pl. 75 : Java.

Very common in suitable localities in peninsular Siam. It even occurs in central and south-eastern Siam, but has never been obtained in the northern districts.

Rhipidura albicollis Vieill.

Platyrhynchus albicollis Vieillot, Nouv. Dict. d'Hist. Nat. xxvii. 1818, p. 13 : Bengal.

Hitherto only recorded from Koon Tan in northern Siam.

Rhipidura albifrontata burmanica Hume.

Leucocerca burmanica Hume, Stray Feathers, ix. 1881, p. 175 (footnote) : Thoungyeen, Burma.

A few specimens of this bird were observed by the present author at Koh Lak in S.W. Siam. One was shot and used for identification.

Tchitrea paradisi affinis Blyth.

Tchitrea affinis Blyth, Journ. Asiat. Soc. Bengal, xv. 1846, p. 292 : "Common in the Malayan Peninsula, Tenasserim, and occurs rarely in Arrakan."

Fairly common throughout the whole country, where it probably breeds.

Tchitrea paradisi incei Gould.

Muscipeta incei Gould, Birds Asia, ii. 1852, pl. 19 : Shanghai.

Authentic specimens of this bird have been collected at Ban Sai Kau, Nawngchik, Bukit Besar, and Bangkok. Probably only a winter visitor.

Philentoma velatum Temm.

Drymophila velata Temminck, Planches Col. Nr. 334, 1823 : Borneo.

In Siam this species has only been met with in the peninsular parts, specimens having been recorded from Bukit Besar, Nawngchik, and Kao Nawng.

Philentoma pyrhopterum Temm.

Muscicapa pyrhoptera Temminck, Planches Col. Nr. 596, 1823: Borneo.

Met with at Bukit Besar, Nawngchik, Trang, and Bandon.

Culicicapa ceylonensis Swains.

Platyrhynchus ceylonensis Swainson, Zool. Illustr. ser. i. pt. i. 1821, pl. 13: Ceylon.

Recorded from northern, eastern, and peninsular Siam. Rather common.

Cryptolopha burki tephrocephala Anders.

Culicipeta tephrocephalus Anderson, P. Z. S. Lond. 1871, p. 213: Bhamo, Burma.

Only met with in northern Siam, where specimens have been collected at Koon Tan and Kao Plyng.

Cryptolopha youngi Rob.

Cryptolopha youngi Robinson, Journ. Fed. Mal. States Mus. v. 1915, p. 100: Kao Nawng, Bandon, peninsular Siam.

Up to the present only known from the type specimen.

Abrornis superciliaris superciliaris Tick.

Abrornis superciliaris Tickell, Journ. Asiat. Soc. Bengal, xxviii. 1859, p. 414: Tenasserim.

Not uncommon in northern Siam, where specimens have been obtained at Koon Tan, Pak Koh, Meh Lem, and Doi Par Sakeng.

Abrornis superciliaris schwaneri Blyth.

Abrornis schwaneri Blyth, Ibis, 1870, p. 169: Borneo.

A Malayan form, having only been obtained within Siamese territory at Kao Nawng and Ban Kok Klap.

Stoparola melanops melanops Vig.

Muscicapa melanops Vigors, P. Z. S. Lond. 1831, p. 171: Himalayas.

Generally distributed throughout Siam proper, though nowhere abundant. Southwards it extends at least as far as Koh Lak, but the southern limits of its range are not properly defined.

Stoparola melanops thallassoides Cab.

Glaucomyias thalassoides Cabanis, Mus. Hein. i. 1850, p. 53, footnote : Sumatra.

Replaces the foregoing in peninsular Siam. Specimens recorded from Trang.

Cyornis sumatrensis Sharpe.

Siphia sumatrensis Sharpe, Cat. Birds Brit. Mus. iv. 1879, p. 451 : Malacca.

Apparently not uncommon in peninsular Siam and the neighbouring islands, where numerous specimens have been collected. Also recorded from Lat Bua Kao in eastern Siam. Northern limits of range not definitely ascertained.

Cyornis banyumas tickelliæ Blyth.

Cyornis tickelliæ Blyth, Journ. Asiat. Soc. Bengal, xii. 1843, p. 941 : Madras.

Specimens identified as belonging to this form have been collected at Koon Tan, Bang Hue Hom, Den Chai (N. Siam), Muang Pa Tong Tschai (E. Siam), and on the islands Koh Klum and Koh Rang.

Cyornis dialilæma Salvad.

Cyornis dialilæma Salvadori, Ann. Mus. Civico Genova, xxvii. 1889, p. 387 : Taho, Karennee.

One of the most common members of the genus *Cyornis* in northern Siam. It has also been recorded from Trang and Bandon in peninsular Siam.

Cyornis rubeculoides Vig.

Phœnicura rubeculoides Vigors, P. Z. S. Lond. 1831, p. 35 : Himalayas.

Recorded from Koon Tan by the present author. Gairdner mentions it from the provinces of Ratburi and Petchaburi in south-western Siam.

Cyornis magnirostris cærulifrons Stuart Baker.

Cyornis magnirostris cærulifrons Stuart Baker, Bull. Brit. Ornith. Club, xxxix. 1918, p. 8 : Klong Bang Lai, peninsular Siam.

Recently described from specimens collected at Klong Bang Lai. The present author also obtained a single male example in the mountain regions west from Koh Lak in south-western Siam. Specimens from Trang most certainly belong to this race, though they have been recorded under the heading of *Cyornis magnirostris.*

Cyornis pallidipes hainana Grant.

Siphia hainana Grant, Bull. Brit. Ornith. Club, x. 1900, p. 36 : Five Finger Mounts, C. Hainan.

The specimens of the White-bellied Blue Flycatcher recorded from Siam most certainly all belong to the form described from Hainan. Unfortunately only males have been obtained, and as the differences between the typical form and that from Hainan are very slight and only noticeable in the females, it has been impossible to definitely state to which subspecies the Siamese birds belong. In Siam it has hitherto only been met with by Kloss and myself at Koon Tan, Pak Koh (N. Siam), and at Lat Bua Kao and Klong Menao in the eastern districts.

Cyornis oatesi Salvad.

Niltava oatesi Salvadori, Ann. Mus. Civico Genova, (2) 1887, p. 514 : Mooleyit, Tenasserim.

Hitherto only recorded from Koon Tan in northern Siam.

Cyornis cyaneus Hume.

Muscitrea cyanea Hume, Stray Feathers, v. 1877, p. 101 : Tenasserim.

Stated in the Cat. Birds Brit. Mus. vol. viii. 1883, p. 225, to inhabit Siam, but nothing else is known about its occurrence in that country, and no recent collector has ever met with it there.

Cyornis unicolor infuscata Blyth.

Musicapa infuscata Blyth, Ibis, 1870, p. 165 : Java.

Recently recorded from Siam by Herbert (*vide* Journ. Nat. Hist. Soc. Siam, ii. Nr. 1, 1916, p. 58).

Anthipes submoniliger malayana Sharpe.

Digenia malayana Sharpe, P. Z. S. Lond. 1888, p. 247 : Larut Mts., Perak.

Recorded from peninsular Siam, where specimens have been collected at Kao Nawng.

Anthipes olivacea Hume.

Cyornis olivacea Hume, Stray Feathers, v. 1877, p. 338 : S. Tenasserim.

Like the former species this bird has only been obtained in peninsular Siam, where specimens have been collected at Tung Song, Maprit, and Kao Nawng in the province of Bandon.

Muscitrea grisola grisola Blyth.

Tephrodornis grisola Blyth, Journ. Asiat. Soc. Bengal, xii. 1843, p. 180 : near Calcutta.

Found along the coasts of peninsular Siam, as for instance at Koh Lak, where it was quite common. Also met with on several of the islands off the western coast and on those situated in the Gulf of Siam.

Family HIRUNDINIDÆ.

Chelidon rustica gutturalis Scop.

Hirundo gutturalis Scopoli, Del. Floræ et Faunæ Insubr. ii. 1786, p. 96 : Panay, Philippines.

Rather abundant in suitable localities during the winter months. It also breeds in Siam, nests having been found on some of the small rocky islands in the Gulf of Siam.

Chelidon javanica Sparrm.

Hirundo javanica Sparrman, Mus. Carlsonianum, ii. 1789, pl. 100 : Java.

This Swallow has been found in peninsular Siam, on several of the islands in the Inner Gulf of Siam, and on those situated along the western coast.

Chelidon badia Cass.

Cecropis badia Cassin, Proc. Acad. Philad. 1853, p. 371: Malacca.

Recorded from Ban Kok Klap, Biserat, and Jalor in peninsular Siam, and from the island of Terutau.

Chelidon daurica striolata Temm. & Schleg.

Hirundo striolata Temminck & Schlegel, in Siebold's Fauna Japon., Aves, 1847, p. 33: Japan.

Recently recorded from Chienghai in northern Siam by Williamson (*vide* Journ. Nat. Hist. Soc. Siam, iii. Nr. 1, 1918, p. 23).

Riparia paludicola chinensis Gray.

Hirundo chinensis Gray, in Hardwicke's Illustr. Ind. Zool. i. 1830–1832, pl. 35. fig. 3: China.

Along the course of the Meh Koke River at Chienghai in northern Siam the Chinese Sand-Martin was very common indeed during my stay in 1914. Nothing else is recorded about its occurrence and distribution in Siam.

Family PITTIDÆ.

Anthocichla phayrii Blyth.

Anthocincla phayrii Blyth, Journ. Asiat. Soc. Bengal, xxxi. 1862, p. 343: Tonghoo, Burma.

This bird was not uncommon at Koon Tan and Pak Koh in northern Siam. It has also been met with by Kloss at Ok Yam and Klong Menao in south-eastern Siam.

Eucichla gurneyi Hume.

Pitta gurneyi Hume, Stray Feathers, iii. 1875, p. 296: S. Tenasserim.

A southern species, having hitherto only been recorded from peninsular Siam.

Eucichla boschi Müll. & Schleg.

Pitta boschi Müller & Schlegel, Nat. Gesch. Ned. Overz. Bez. Zool. tab. i. 1839–1844, pp. 16, 20: Sumatra.

Found in peninsular Siam, where specimens have been collected at Klong Wang Hip, Trang, and Bandon.

Hydrornis oatesi Hume.

Hydrornis oatesi Hume, Stray Feathers, i. 1873, p. 477: Upper Pegu.

In Siam this rare bird has only been met with twice—viz., at Koon Tan and at Muang Wang in the northern parts of the country.

Pitta cyanea Blyth.

Pitta cyanea Blyth, Journ. Asiat. Soc. Bengal, xii. 1843, p. 1008: Arakan.

Found in suitable localities throughout the whole of Siam. Specimens recorded from Koon Tan, Klong Menao, Ratburi, and Petchaburi. It, however, appears to be very local in its distribution.

Pitta cucullata Hartl.

Pitta cucullata Hartlaub, Rev. Zool. 1843, p. 65: Malacca.

A southern form, hitherto only found in peninsular and south-western Siam.

Pitta megarhyncha Schleg.

Pitta megarhyncha Schlegel, Vog. Ned. Ind. pl. 4. fig. 2, p. 32, 1863: Banka.

In Siam this species has hitherto only been recorded from Pulu Terutau.

Pitta cyanoptera Temm.

Pitta cyanoptera Temminck, Planches Col. Nr. 218, 1823: Java.

Recorded from northern, south-western, and peninsular Siam, though nowhere very common and apparently locally distributed. Also found on Koh Samui and on Pulu Terutau.

Gigantipitta cærulea cærulea Rafll.

Myiothera cærulea Raffles, Trans. Linn. Soc. Lond. xiii. 1822, p. 301: Sumatra.

Hitherto only obtained at Trang and at Maprit, peninsular Siam.

Family EURYLÆMIDÆ.

Psarisomus dalhousiæ dalhousiæ Jameson.

Eurylaimus dalhousiæ Jameson, Edinb. New Phil. Journ. xviii. 1835, p. 389 : N. India.

The Long-tailed Broadbill has up to the present time only been met with in the hilly parts of northern Siam.

Cymbirhynchus macrorhynchus malaccensis Salvad.

Cymbirhynchus malaccensis Salvadori, Atti R. Acc. Sci. di Torino, ix. 1874, p. 425 : Malacca.

Distributed throughout peninsular, south-western, central, eastern, and south-eastern Siam, though nowhere common.

Serilophus lunatus lunatus Gould.

Eurylaimus lunatus Gould, P. Z. S. Lond. 1833, p. 133 : Rangoon, Burma.

Apparently rare and quite confined to northern Siam, where specimens have been obtained at Kao Plyng and Bang Hue Hom.

Serilophus lunatus rothschildi Hart. & Butler.

Serilophus rothschildi Hartert & Butler, Bull. Brit. Ornith. Club, vii. 1898, p. 1 : Gunong Ijau, Perak.

A southern form, hitherto only obtained at Kao Nawng in the province of Bandon, peninsular Siam. The Siamese specimens are somewhat intermediate between the typical form *Serilophus lunatus lunatus* Gould and *Serilophus lunatus rothschildi* Hart. & Butler.

Eurylæmus javanicus Horsf.

Eurylaimus javanicus Horsfield, Trans. Linn. Soc. Lond. xiii. 1822, p. 170 : Java.

Locally distributed and apparently rather rare. Specimens recorded from Koon Tan and Pa Hing in the north and from Kao Nawng in the peninsular parts of the country.

Eurylæmus ochromelus Raffl.

Eurylaimus ochromelus Raffles, Trans. Linn. Soc. Lond. xiii. 1822, p. 297 : Sumatra.

This bird, which is rather common in the Malay Peninsula, has only been found within Siamese territory at Tung Song, Kao Nawng, and Trang, where it is stated to be rare.

Corydon sumatranus Raffl.

Coracias sumatranus Raffles, Trans. Linn. Soc. Lond. xiii. 1822, p. 303 : Sumatra.

In Siam the Dusky Broadbill has been met with in the northern parts of the country at Koon Tang and Pa Hing. Otherwise it has been collected in south-western Siam at Ratburi, Petchaburi, and Hat Sanuk, and on the island of Puket.

Calyptomena viridis Raffl.

Calyptomena viridis Raffles, Trans. Linn. Soc. Lond. xiii. 1822, p. 295 : Sumatra.

Hitherto only recorded from peninsular Siam, where it, however, appears to be rather rare. Specimens obtained at Trang, Bukit Besar, Nawngchik, Bandon, Hat Sanuk, and on the island of Puket.

Family Caprimulgidæ.

Caprimulgus asiaticus Lath.

Caprimulgus asiaticus Latham, Ind. Orn. ii. 1790, p. 588 : India.

Apparently confined to central, eastern, south-western, and peninsular Siam. Hitherto not recorded from the northern districts.

Camprimulgus monticolus Frankl.

Caprimulgus monticolus Franklin, P. Z. S. Lond. 1831, p. 116 : C. India.

In Siam this Nightjar has only been met with in the northern parts, and seems to be rare.

Caprimulgus indicus jotaka Temm. & Schleg.

Caprimulgus jotaka, Temminck & Schlegel, in Siebold's Fauna Japon., Aves, pl. 12, p. 37, 1847 : Japan.

Found on Pulu Terutau and at Chong in Trang, peninsular Siam. Probably a migratory bird to this part of the world.

Caprimulgus macrurus albonotatus Tick.

Caprimulgus albonotatus Tickell, Journ. Asiat. Soc. Bengal, ii. 1833, p. 580 : Bengal.

This form has hitherto only been obtained in northern Siam, where specimens have been collected at Pak Koh and at the Meh Yome River.

Caprimulgus macrurus bimaculatus Peale.

Caprimulgus bimaculatus Peale, U.S. Expl. Exped. viii. 1848, p. 170 : Malacca.

Replaces the foregoing larger and paler form in peninsular and eastern Siam.

Lyncornis cerviniceps Gould.

Lyncornis cerviniceps Gould, Icon. Av. pt. ii. 1838, pl. 14 : "Said to be a native of China or adjacent islands."—*Errore* !

This beautiful Nightjar was very common indeed at Hat Sanuk in S.W. Siam. It seems mostly to affect hilly country, and most certainly occurs along the whole western border. In south-eastern Siam it has also been collected at Klong Yai, but it appears to be rather rare in those parts of the country.

Family CYPSELIDÆ.

Apus affinis subfurcatus Blyth.

Cypselus subfurcatus Blyth, Journ. Asiat. Soc. Bengal, xviii. 1849, p. 807 : Penang.

Obtained at Koh Lak and on the islands of Koh Luan and Koh Muk.

Apus pacificus pacificus Lath.

Hirundo pacifica Latham, Ind. Ornith. Suppl. 1801, p. lviii : New South Wales, Australia.

A few specimens have been collected at Bangkok and on the island of Koh Pennan, off the eastern coast of peninsular Siam.

Tachornis infumata Scl.

Cypselus infumatus Sclater, P. Z. S. Lond. 1865, p. 602: Borneo.

Recorded as being very abundant on Koh Samui and Koh Pennan after rain. Otherwise only obtained at Chong (Trang), Ban Sai Kau, Koh Lak, and Bangkok.

Collocalia francica germaini Oust.

Collocalia germaini Oustalet, Bull. Soc. Philom. Paris, 1876, pp. 1–3: Pulu Condor.

Recorded from Koh Lak and from the islands of Koh Samui, Koh Pennan, and Pulu Lontar. The occurrence and distribution in Siam of the birds belonging to the genus *Collocalia* is very imperfectly known and ought to be studied.

Collocalia innominata Hume.

Collocalia innominata Hume, Stray Feathers, i. 1873, p. 294: Port Monat, Andaman Isl.

Only recorded from Pulau Belitung, S.W. Terutau, where it was nesting in great numbers.

Chætura gigantea indica Hume.

Chætura indica Hume, Stray Feathers, i. 1873, p. 471: "India and Andamans."

Distribution in Siam very imperfectly known. Specimens only collected at Meh Lem, Pak Koh, and Hue San Noi in the north. Also reported from Puket.

Family MACROPTERYGIDÆ.

Hemiprocne longipennis Rafin.

Hirundo longipennis Rafinesque, Bull. Soc. Philom. Paris, iii. 1803, p. 153: Java.

Recorded from Trang in peninsular Siam.

Hemiprocne coronata Tick.

Hirundo coronata Tickell, Journ. Asiat. Soc. Bengal, ii. 1833, p. 580: Borabhun and Dholbum, west of Calcutta, India.

Rather abundant in the hill-forests of northern and north-western Siam.

Hemiprocne comata Temm.

Cypselus comatus Temminck, Planches Col. Nr. 268, 1824: Sumatra.

Recorded from Trang in peninsular Siam.

Family UPUPIDÆ.

Upupa epops longirostris Jerd.

Upupa longirostris Jerdon, Birds India, i. 1862, p. 393: Burma.

Commonly distributed throughout the whole country. Never found in the evergreen forest regions.

Upupa epops saturata Lönnb.

Upupa epops saturata Lönnberg, Arkiv för Zool. v. Nr. 9, 1909, p. 29: Kiachta.

A winter visitor to Siam, where authentic specimens have been recorded from Koh Lak.

Family CORACIIDÆ.

Coracias affinis McClell.

Coracias affinis McClelland, P. Z. S. Lond. 1839, p. 164: Assam.

Abundant in suitable localities throughout the whole country.

Eurystomus orientalis orientalis Linn.

Coracias orientalis Linnæus, Syst. Nat. Ed. xii. 1766, p. 159: Java.

Not uncommon throughout the whole country, though locally distributed.

Eurystomus orientalis calonyx Sharpe.

Eurystomus calonyx Sharpe, P. Z. S. Lond. 1890, p. 551: Nepal.

Authentic specimens of this bird, which is very similar to the last-named species, have been collected at Trang, Patani and at Pak Koh in the north.

Batrachostomus affinis Blyth.

Batrachostomus affinis Blyth, Journ. Asiat. Soc. Bengal, xvi. 1847, p. 1180: Malacca.

Extremely rare and hitherto only recorded by Gairdner from south-western Siam.

Family Bucerotidæ.

Dichoceros bicornis Linn.

Buceros bicornis Linnæus, Syst. Nat. Ed. x. 1758, p. 104: China.

The Great Hornbill is confined to the forests, and is common throughout the whole country. It is very shy and thus not easy to obtain, as it keeps to the highest trees.

Anthracoceros albirostris Shaw & Nodd.

Buceros albirostris Shaw & Nodder, Gen. Zool. viii. 1818, p. 13: Chandernagore, Bengal.

Quite common throughout the country.

Anthracoceros convexus Temm.

Buceros convexus Temminck, Planches Col. Nr. 530, 1831: Java.

Replaces the foregoing in the southernmost parts of Siam. Specimens recorded from Bukit Besar, Biserat, and Jalor.

Anorrhinus austeni Jerd.

Anorrhinus austeni Jerdon, Ibis, 1872, p. 6: N. Cachar Hills.

Apparently very rare in Siam, where it only has been obtained up to the present time at Koon Tan.

Anorrhinus tickelli Blyth.

Buceros tickelli Blyth, Journ. Asiat. Soc. Bengal, xxiv. 1855, p. 266: Tenasserim.

Obtained by Gairdner near Sai Yoke in south-western Siam near the Tenasserim frontier.

Rhytidoceros undulatus Shaw.

Buceros undulatus Shaw, Gen. Zool. viii. 1811, p. 26: Java.

In Siam the Malayan Wreathed Hornbill has been recorded from Pa Hing (N. Siam), Klong Yai (S.E. Siam), and from the islands Koh Kut, Terutau, Puket, and Pulu Lontar.

Rhytidoceros subruficollis Blyth.

Buceros subruficollis Blyth, Journ. Asiat. Soc. Bengal, xii. pt. i. 1843, p. 177: Tenasserim.

Gairdner records this species from the provinces of Ratburi and Petchaburi, and I have obtained it at the Meh Lem River in northern Siam.

Family MEROPIDÆ.

Merops viridis Linn.

Merops viridis Linnæus, Syst. Nat. Ed. xii. 1766, p. 182: Java.

Recorded from peninsular and eastern Siam, though not very abundant.

Merops lamark birmanus Neum.

Merops viridis birmanus Neumann, Ornith. Monatsber. xvii. 1910, p. 80: Myingan, Burma.

Apparently found throughout the whole country, as specimens have been collected at Den Chai (N. Siam), Koon Tan (N. Siam), Lat Bua Kao, Sakerat (E. Siam), and at Koh Lak (S.W. Siam).

Merops superciliosus philippinus Linn.

Merops philippinus Linnæus, Syst. Nat. Ed. xii. 1767, p. 183: Philippines.

Not uncommon during the winter months in peninsular Siam and on the neighbouring islands. Less abundant in other parts of Siam.

Melittophagus leschenaulti swinhoei Hume.

Merops swinhoei Hume, Nest and Eggs Ind. Birds, 1872, p. 102: India, Nilghiris, etc.

Found throughout the whole country.

Nyctiornis athertoni Jard. & Selby.

Nyctiornis athertoni Jardine & Selby, Ill. Orn. ii. 1828, pl. 58: "India."

Not common, though generally distributed throughout Siam proper and extending southwards at least to the latitude of Koh Lak.

Nyctiornis amicta Temm.

Merops amictus Temminck, Planches Col. Nr. 310, 1824: Bencoolen, Sumatra.

Replaces the foregoing species in the southern parts of peninsular Siam. Specimens recorded from Ban Kok Klap, Kao Nawng, Bandon, Trang, and Ratburi (according to Gairdner).

Family ALCEDINIDÆ.

Ceyx tridactyla Pall.

Alcedo tridactyla Pallas, Spic. Zool. vii. pl. 2. fig. 1, p. 10, 1769: India.

Generally distributed throughout Siam, though nowhere common.

Ceyx rufidorsa innominata Salvad.

Ceyx innominata Salvadori, Atti R. Accad. Torino, iv. 1869, p. 465: Java.

Recorded from peninsular Siam, where specimens have been collected at Ban Kok Klap. Also found on the island of Puket.

Carcineutes pulchellus Horsf.

Dacelo pulchella Horsfield, Trans. Linn. Soc. Lond. xiii. 1821, p. 175: Java.

Generally distributed throughout the whole country, though apparently not common.

Halcyon coromanda coromanda Lath.

Alcedo coromanda Lath. Ind. Orn. i. 1790, p. 252: Coromandel coast.

Not common, though generally distributed throughout Siam, specimens having been collected at Koon Tan, Patani, and on Puket and Pulu Terutau.

Halcyon smyrnensis fusca Bodd.

Alcedo fusca Boddaert, Tabl. Pl. Enl. 1783, p. 54: Malacca.

Very common throughout the whole country.

Halcyon pileata Bodd.

Alcedo pileata Boddaert, Tabl. Pl. Enl. 1783, p. 41: China.

Abundant throughout Siam.

Halcyon chloris armstrongi Sharpe.

Halcyon armstrongi Sharpe, Cat. Birds Brit. Mus. xvii. 1892, p. 277: Malay Peninsula.

Occurs in central, south-eastern, south-western, and peninsular Siam, but not recorded from the northern parts.

Halcyon concretus Temm.

Dacelo concreta Temminck, Planches Col. Nr. 346, 1825: Sumatra.

Recorded by Robinson & Kloss from peninsular Siam.

Alcedo ispida bengalensis Gm.

Alcedo bengalensis Gmelin, Syst. Nat. i. 1788, p. 450: Bengal.

The eastern race of the Common Kingfisher is very abundant in suitable localities throughout the whole country.

Alcedo meninting scintillans Stuart Baker.

Alcedo meninting scintillans Stuart Baker, Bull. Brit. Ornith. Club, xxxix. 1919, p. 38: Bankasoon, S. Tenasserim.

Recently separated by Stuart Baker, and stated by him to be found in peninsular Siam between latitudes 10° and 16° N.

Alcedo meninting meninting Horsf.

Alcedo meninting Horsfield, Trans. Linn. Soc. Lond. xiii. 1822, p. 172: Java.

Occurs in peninsular Siam north to about latitude 10° N. It, however, appears to be rather rare.

Alcedo meninting coltarti Stuart Baker.

Alcedo meninting coltarti Stuart Baker, Bull. Brit. Ornith. Club, xxxix. 1919, p. 39: Saddya, Assam.

Said by Stuart Baker to inhabit north and central Siam, but I do not know on what authority.

Alcedo euryzona Temm.

Alcedo euryzona Temminck, Planches Col. livr. 86 (texte only), 1830 : Java.

Met with and recorded from Trang and from Bandon, peninsular Siam.

Pelargopsis amauroptera Pears.

Halcyon amauroptera Pearson, Journ. Asiat. Soc. Bengal, x. 1841, p. 635 : Calcutta.

Appears to be exclusively confined to peninsular Siam, where it seems to be rather rare, specimens having been collected at Trang, Pulu Terutau, and Puket.

Pelargopsis gurial burmanica Sharpe.

Pelargopsis burmanica Sharpe, P. Z. S. Lond. 1870, p. 67 : Tonghoo, Burma.

Quite common in Siam proper, and extending southwards at least to Petchaburi, but southern limits of range still not properly ascertained.

Pelargopsis capensis malaccensis Sharpe.

Pelargopsis malaccensis Sharpe, P. Z. S. Lond. 1870, p. 67 : Malacca.

Extends northwards to the province of Petchaburi. Rather common in the southern parts of peninsular Siam.

Pelargopsis fraseri Sharpe.

Pelargopsis fraseri Sharpe, P. Z. S. Lond. 1870, p. 65 : Java.

Originally described from Java, but specimens belonging to this form have been recorded from Ban Sai Kau, Biserat, Nawngchik, and Patani.

Ceryle rudis leucomelanura Reichenb.

Ceryle leucomelanura Reichenbach, Handb. Alced. 1851, p. 21, pl. 409 B. fig. 3488 : Ceylon.

Common in suitable localities in northern and central Siam. Its southern limits of range are still uncertain, but the present author observed specimens along the railway-line north of the town Ratburi.

Family PSITTACIDÆ.

Loriculus vernalis Sparrm.

Psittacus vernalis Sparrman, Mus. Carlsonianum, 1787, t. 29.

Generally though locally distributed throughout Siam proper. Southwards it has been recorded from Trang and Ban Kok Klap, but still further south it is replaced by the next species.

Loriculus galgulus Linn.

Psittacus galgulus Linnæus, Syst. Nat. Ed. x. 1758, p. 103: Malay Peninsula.

In Siam this form has hitherto only been recorded from Biserat, Jalor, Patelung, and Patani.

Psittinus incertus malaccensis Lath.

Psittacus malaccensis Latham, Ind. Orn. i. 1790, p. 130: Malacca.

Obtained at Biserat and Jalor in the southern parts of peninsular Siam. In the R. Nat. Hist. Mus. in Stockholm there is a specimen, labelled "Bangkok, Siam," but this locality is most probably wrong, if the specimen has not been a cage-bird.

Palæornis eupataria siamensis Kloss.

Palæornis eupataria siamensis Kloss, Journ. Nat. Hist. Soc. Siam, ii. 1917, p. 219: Lat Bua Kao, E. Siam.

Authentic specimens of this newly-described race have been collected at Koon Tan, Sukothai, and Sawankalok, besides the type specimen which was obtained at Lat Bua Kao.

Palæornis fasciata S. Müll.

Psittacus fasciatus S. Müller, Natursyst. Anhang, 1776, p. 74: Pondichery.

The most common Parrot in Siam. It has been recorded from the northern, eastern, south-eastern, central, and south-western parts of the country.

Palæornis cyanocephalus rosa Bodd.

Psittacus rosa Boddaert, Tabl. Pl. Enl. 1783, p. 53 : India.

Locally distributed throughout the country, but rather rare. Specimens have been collected at the following localities : Den Chai, Pak Pan, Pak Koh (N. Siam), Saraburi (E. Siam), Ratburi, Petchaburi (S.W. Siam), and it extends at least as far south as Koh Lak.

Palæornis schisticeps finschi Hume.

Palæornis finschi Hume, Stray Feathers, ii. 1874, p. 509 : Kollidoo.

Recorded from northern Siam, where specimens have been collected at Koon Tan and Pak Koh.

Family Cuculidæ.

Coccystes coromandus Linn.

Cuculus coromandus Linnæus, Syst. Nat. Ed. xii. 1766, p. 171 : Coromandel coast.

The Red-winged Crested Cuckoo has been found in northern, north-western, central, and peninsular Siam as far south as Trang. Not common.

Surniculus lugubris dicruroides Hodgs.

Pseudornis dicruroides Hodgson, Journ. Asiat. Soc. Bengal, viii. 1839, p. 136 : Nepal.

This race of the Drongo Cuckoo is distributed throughout the whole of Siam, though not very abundant.

Hierococcyx fugax nanus Hume.

Hierococcyx nanus Hume, Stray Feathers, v. 1877, p. 490 : S. Tenasserim.

Extremely rare in Siam, and hitherto only recorded from Maprit and Puket.

Hierococcyx fugax nisicolor Blyth.

Cuculus nisicolor Blyth, Journ. Asiat. Soc. Bengal, xii. 1843, p. 943 : Nepal.

Hitherto only recorded from peninsular Siam, where specimens have been collected at Trang, Ban Kok Klap, Pulu Terutau, and Puket.

Hierococcyx sparverioides Vig.

Cuculus sparverioides Vigors, Proc. Committee Zool. Soc. Lond. pt. i. 1832, p. 173: Himalayas.

Sparsely found in Siam, specimens having been recorded from Koon Tan (N. Siam), Bangkok (C. Siam), Trang (peninsular Siam), and from the islands of Puket and Pulu Lontar.

Hierococcyx varius Vahl.

Cuculus varius Vahl, Skriv. af Natur. Selsk. Copenhagen, iv. 1797, p. 61: Tranquebar.

Apparently extremely rare in Siam, where it only has been found up to the present time at Hua Hin.

Cuculus micropterus Gould.

Cuculus micropterus Gould, P. Z. S. Lond. 1837, p. 137: Himalayas.

Recorded from northern Siam, from Bangkok, Trang, and from the island of Puket.

Penthoceryx sonnerati sonnerati Lath.

Cuculus sonnerati Latham, Ind. Orn. i. 1790, p. 215: India.

The typical race of the Banded Bay Cuckoo is found in northern and central Siam, though it appears to be rather rare.

Penthoceryx sonnerati venustus Jerd.

Cuculus venustus Jerdon, Madr. Journ. Lit. Sci. xiii. 1842, p. 140: Malacca.

Replaces the foregoing in the southern parts of peninsular Siam. Specimens recorded from Chong in Trang and from Puket most certainly have to be referred to this race, though they have been mentioned as *Penthoceryx sonnerati* Lath.

Cacomantis merulinus querulus Heine.

Cacomantis querulus Heine, Journ. für Ornith. 1863, p. 352: "India, Nepal, Burma."

Found in peninsular and south-western Siam, extending northwards at least to Bangkok and perhaps northern Siam, where it appears to be very rare.

Cacomantis sepulchralis sepulchralis S. Müll.

Cuculus sepulchralis S. Müller, Verh. Natuurl. Gesch., Land- en Volkenk. 1843, p. 177 : Java.

A southern form, hitherto only met with in Siam on Koh Muk and Puket.

Chalcococcyx maculatus Gm.

Trogon maculatus Gmelin, Syst. Nat. i. 1788, p. 404 : Ceylon ?

Recorded from the neighbourhood of Bangkok, and also met with in Trang.

Chalcococcyx xanthorhynchus malayanus Raffl.

Cuculus malayanus Raffles, Trans. Linn. Soc. Lond. xiii. 1822, p. 286 : Malay Peninsula.

Recorded from several localities in peninsular Siam. Also met with at Bangkok.

Eudynamis orientalis malayana Cab. & Heine.

Eudynamis malayana Cabanis & Heine, Mus. Hein. iv. 1862, p. 52 : Sumatra.

The Koel is very common in suitable localities throughout the whole country.

Centropus sinensis intermedius Hume.

Centrococcyx intermedius Hume, Stray Feathers, i. 1873, p. 454 : Thayetmyo.

Common everywhere in suitable localities.

Centropus bengalensis bengalensis Gm.

Cuculus bengalensis Gmelin, Syst. Nat. i. 1788, p. 412 : Bengal.

Recorded from northern, central, and south-western Siam as well as from the island of Puket. Apparently rather rare.

Centropus bengalensis javanensis Dum.

Cuculus javanensis Dumont, Dict. Sc. Nat. xi. 1818, p. 144: Java.

Specimens belonging to this race have only been collected on Puket.

Zanclostomus javanicus Horsf.

Phœnicophaës javanicus Horsfield, Trans. Linn. Soc. Lond. xiii. 1822, p. 178 : Java.

Apparently confined to peninsular Siam, where specimens have been collected at Trang, Bukit Besar, Nawngchik, Biserat, Jalor, Ban Kok Klap, Bangkok, and Puket.

Taccocua leschenaulti Less.

Taccocua leschenaulti Lesson, Traité d'Orn. 1831, p. 144 : "Habite l'Inde."

In the Proceedings of the Zoological Society, London, 1859, p. 151, Gould records specimens collected by Sir R. Schomburgk in Siam. No other particulars are given, and as no recent collector has ever met with it in Siam, its occurrence in that country seems doubtful.

Rhopodytes tristis longicaudatus Blyth.

Phœnicophaës longicaudatus Blyth, Journ. Asiat. Soc. Bengal, x. 1841, p. 923 : Moulmein.

This race of the Large Green-billed Malkoha is commonly distributed throughout the whole country.

Rhopodytes sumatranus Raffl.

Cuculus sumatranus Raffles, Trans. Linn. Soc. Lond. xiii. 1822, p. 287 : Sumatra.

Hitherto only recorded from Trang and from the island of Telibun.

Rhopodytes diardi Less.

Melias diardi Lesson, Traité d'Orn. 1831, p. 132 : Sumatra.

Rare in peninsular Siam, where specimens have been collected at Trang, Biserat, Jalor, and Mabek. Mr. Barton also records this bird from the Me Taw forest near Raheng in central Siam, but his identification is most probably due to a mistake.

Rhinortha chlorophæa Raffl.

Cuculus chlorophæus Raffles, Trans. Linn. Soc. Lond. xiii. 1822, p. 288 : Sumatra.

Recorded from Trang, Biserat, Mabek, and Jalor in peninsular Siam.

Carpococcyx renauldi Oust.

Carpococcyx renauldi Oustalet, Bull. Mus. Paris, ii. 1896, p. 314: Annam.

Recently obtained in peninsular Siam. Very rare.

Urococcyx erythrognathus Hartl.

Phœnicophæus erythrognathus Hartlaub, Verz. Mus. Brem. 1844, p. 95: Sumatra.

Inhabits peninsular Siam, where it appears to be fairly common. Also found on the island of Puket.

Family Capitonidæ.

Calorhamphus fuliginosa hayi Gray.

Bucco hayi Gray, Zool. Misc. 1832, p. 33: Malacca.

This Barbet is apparently very rare in Siam, and up to the present time has only been met with at Trang and on the small island of Pulu Lontar, off the western coast of south-west Siam.

Megalæma virens Bodd.

Bucco virens Boddaert, Tabl. Pl. Enl. 1783, p. 53, pl. 871: China.

Inhabits the evergreen forests of northern and north-western Siam, where it is not uncommon. The Siamese specimens are somewhat intermediate between the typical *M. v. virens* Bodd. from southern China, Burma, and Karennee and *M. v. marshallorum* Swinh. from the Himalayas and Manipur.

Chotorea chrysopogon Temm.

Bucco chrysopogon Temminck, Planches Col. Nr. 285, 1824: Sumatra.

Hitherto only recorded from peninsular Siam, north to Kao Nawng in the province of Bandon.

Chotorea versicolor Raffl.

Bucco versicolor Raffles, Trans. Linn. Soc. Lond. xiii. 1822, p. 284: Singapore.

Recorded from Trang and Bangnara in peninsular Siam.

Chotorea mystacophanes Temm.

Bucco mystacophanes Temminck, Planches Col. Nr. 315, 1824 : Sumatra.

Inhabits peninsular Siam, where it seems to be more common than the other members of the genus *Chotorea.*

Thereiceryx faiostricta faiostricta Temm.

Bucco faiostricta Temminck, Planches Col. Nr. 527, 1831 : Cochin China.

Quite common in northern and north-western Siam. It has also been found in the eastern parts of the country, though it seems to be more rare there. Also an inhabitant of Cochin China and Annam.

Thereiceryx lineatus hodgsoni Bp.

Megalæma hodgsoni Bonaparte, Consp. Gen. Av. i. 1850, p. 144: Nepal.

The larger northern race is very common in northern and central Siam.

Thereiceryx lineatus intermedius Stuart Baker.

Thereiceryx lineatus intermedius Stuart Baker, Bull. Brit. Ornith. Club, xxxix. 1918, p. 19 : Pahpoon, Burma.

This race is intermediate between the typical *T. l. lineatus* Vieill. from Java and *T. l. hodgsoni* Bp. It is found throughout peninsular Siam.

Cyanops asiatica asiatica Lath.

Trogon asiaticus Latham, Ind. Orn. 1790, p. 201 : India.

Hitherto only obtained in northern and north-western Siam, where specimens have been collected at Koon Tan, Doi Par Sakeng, and Doi Vieng Par.

Cyanops asiatica davisoni Hume.

Megalaima davisoni Hume, Stray Feathers, v. 1875, p. 108 : Meetan, S. Tenasserim.

Not uncommon in north-western and western Siam. Also obtained at Kao Nawng in the province of Bandon, peninsular Siam.

Cyanops franklini ramsayi Wald.

Megalæma ramsayi Walden, Ann. & Mag. Nat. Hist. (4) xv. 1875, p. 400: Karennee.

Up to the present time only a single specimen of this species has been procured in Siam: viz., at Doi Par Sakeng.

Cyanops duvaucelii cyanotis Blyth.

Bucco cyanotis Blyth, Journ. Asiat. Soc. Bengal, xvi. 1847, p. 487: Bengal.

Inhabits those parts of Siam which lie north of the peninsula. Robinson described a new subspecies on specimens from Ok Yam in south-east Siam under the name of *C. d. orientalis* (Ibis, 1915, p. 738), but this race does not seem to be valid.

Xantholæma hæmacephala indica Lath.

Bucco indicus Latham, Ind. Orn. i. 1790, p. 205: India.

Very abundant throughout the whole country. The typical form, *Xantholæma hæmacephala hæmacephala* S. Müller, inhabits the Philippine Islands.

Family Indicatoridæ.

Indicator archipelagicus Temm.

Indicator archipelagicus Temminck, Planches Col. Nr. 542, fig. 1, 1832: Pontianak, Borneo.

The Malayan Honey-guide seems to be extremely rare in Siam. Up to the present time it has only been recorded from Trang in the peninsula.

Family Picidæ.

Picus vittatus eisenhoferi Gyld.

Picus vittatus eisenhoferi Gyldenstolpe, Ornith. Monatsber. 1916, p. 28: Pa Hing, N. Siam.

This race inhabits the whole of Siam, where it seems to be rather common. It differs from the typical *P. v. vittatus* Vieill. (type locality Java) merely in size.

Picus viridanus Blyth.

Picus viridanus Blyth, Journ. Asiat. Soc. Bengal, xii. 1843, p. 1000 : Arrakan.

Appears to be rather common in peninsular Siam, where numerous specimens have been collected at various localities.

Picus striolatus Blyth.

Picus striolatus Blyth, Journ. Asiat. Soc. Bengal, xii. 1843, p. 1000 : Himalayas.

Recorded from northern Siam, from Koh Lak, and from Petchaburi.

Picus canus hessei Gyld.

Picus canus hessei Gyldenstolpe, Ornith. Monatsber. 1916, p. 28 : Pak Koh, N. Siam, ♂; Den Chai, N. Siam, ♀.

Very common in the dry forests of the northern parts of the country, where numerous specimens have been collected at various localities. It has also been reported from Lat Bua Kao in eastern, from Petchaburi in south-western, and from Meklong in central Siam.

Picus erythropygius erythropygius Elliot.

Gecinus erythropygius Elliot, Nouv. Arch. du Mus. Paris, Bull. i. 1865, p. 76, pl. 3 : Lower Cochin China.

Apparently very rare in Siam. Up to the present time specimens have only been collected at Lat Bua Kao and Saketat (E. Siam). Parrot mentions a specimen from "Bangkok," but this locality is most certainly erroneous.

Picus erythropygius nigrigenis Hume.

Gecinus nigrigenis Hume, Proc. Asiat. Soc. Bengal, 1874, p. 106 : Pakchan, S. Tenasserim.

Quite common in the open dry forests of northern Siam. Some specimens have also been obtained at Meklong in central Siam.

Brachylophus chlorolophus chlorolophoides Gyld.

Brachylophus chlorolophoides Gyldenstolpe, Ornith. Monatsber. 1916, p. 29 : Koon Tan, N. Siam.

The Siamese representative of the Small Himalayan

Yellow-naped Woodpecker belongs to the form described by the present author on a single male specimen procured at Koon Tan in northern Siam. In my paper on the birds collected by the Swedish Zoological Expeditions to Siam, 1911–1912, 1914–1915 (Kongl. Svenska Vetenskapsakad. Handl. Bd. 56, Nr. 2, 1916, p. 29) I also recorded some other specimens from various localities in Siam under the name of *Brachylophus chlorolophus chlorolophus* Vieill. The type locality of the typical race may be considered to be Bengal. As suggested by Kloss (Ibis, 1918, p. 106), the Siamese birds all belong to the form described by me, though the type specimen was aberrant in having the red of the crown extremely well developed. I have now been able to compare my Siamese specimens with some birds from Upper Assam and Lower Chindwin, and the Siam birds are certainly different. The nuchal crests are paler and the outer webs of the primaries are unspotted. The primaries and the secondaries are more red and the throat and breast are greener olive and less brown, all these characters being mentioned by Kloss.

Brachylophus puniceus observandus Hart.

Gecinus puniceus observandus Hartert, Nov. Zool. 1896, p. 542 : Borneo.

Inhabits the Malay peninsula, where it is quite abundant. In Siam it has only been met with at Trang and at Kampong Jalor.

Chrysophlegma mentale humei Harg.

Chrysophlegma humii Hargitt, Ibis, 1889, p. 231 : Malacca, ♂ ; Selangor, ♀ .

In Siam this bird appears to be rare, and has only been collected at Trang, Bukit Besar, Nawngchik, and Kao Nawng.

Chrysophlegma miniatum perlutus Kloss.

Callolophus mineatus perlutus Kloss, Ibis, 1918, p. 110 : Koh Lak, S.W. Siam.

Found in the southern parts of peninsular Siam. It becomes very rare towards the north, and a few specimens have been found as far north as at Koh Lak and Hat Sanuk. A well-defined race.

Chrysophlegma flavinucha flavinucha Gould.

Picus flavinucha Gould, P. Z. S. Lond. 1833, p. 120: Himalayas.

The typical race of the Large Yellow-naped Woodpecker is rather common in northern and north-western Siam, being replaced in other parts of the country by some allied forms.

Chrysophlegma flavinucha pierrei Oust.

Chrysophlegma pierrei Oustalet, La Naturaliste, 1889, p. 44: Lower Cochin China.

A very rare bird. In Siam it has hitherto only been found in the eastern and south-western parts, specimens having been collected at Pak Jong, Lat Bua Kao (E. Siam), and at Chan Tuek and Pakchan (S.W. Siam).

Chrysophlegma flavinucha lylei Kloss.

Chrysophlegma flavinucha lylei Kloss, Ibis, 1918, p. 110: Koh Lak, S.W. Siam.

Kloss, when describing this race, says that specimens from southern Siam are smaller than birds from the more northern parts of the country. A very doubtful form.

Chrysophlegma flavinucha wrayi Sharpe.

Chrysophlegma wrayi Sharpe, P. Z. S. Lond. 1888, p. 279: Mts. of Perak.

Within Siamese territory this species has hitherto only been obtained on the island of Puket.

Gauropicoides rafflesi peninsularis Hesse.

Gauropicoides rafflesii peninsularis Hesse, Orn. Monatsber. xix. p. 192: Malacca.

Apparently rare and hitherto only obtained in peninsular Siam.

Gecinulus grantia viridis Blyth.

Gecinulus viridis Blyth, Journ. Asiat. Soc. Bengal, xxxi. 1862, p. 341: Tenasserim.

Quite common in the bamboo-forests of northern and north-western Siam. It has, however, also been met with at Bangkok, at Lat Bua Kao, and Klong Yai (E. Siam), as well as at Ban Kok Klap in the province of Bandon.

Hypopicus hyperythrus Vig.

Picus hyperythrus Vigors, P. Z. S. Lond. 1831, p. 23: Himalayas.

An extremely rare bird in this part of the world. In Siam it has only been met with on a single occasion, viz., at Me-maw near Lampong in the northern parts of the country.

Dendrocopus analis longipennis Hesse.

Dendrocopus analis longipennis Hesse, Ornith. Monatsber. 1912, p. 82: Bangkok.

Siamese specimens are stated to be larger than Javan birds (typical *Dendrocopus analis analis* Horsf.), and have therefore been separated under the above-mentioned name. Curiously enough this bird has hitherto only been collected at Bangkok and its immediate neighbourhood.

Iyngipicus canicapillus Blyth.

Picus canicapillus Blyth, Journ. Asiat. Soc. Bengal, xiv. 1845, p. 197: Malacca.

Rather common in northern Siam. Southwards it becomes more rare, though specimens have been recorded from Patani, Biserat, Jalor, Jambu, and Jhering.

Iyngipicus auritus Eyton.

Tripsurus auritus Eyton, Ann. & Mag. Nat. Hist. (1) xvi. 1845, p. 229: Malacca.

Inhabits the Malay Peninsula, but stated to extend into Siam (*vide* Cat. Birds Brit. Mus. xviii. 1890, p. 326). No recent specimens have, however, been collected to prove this statement.

Pyrrhopicus pyrrhotis Hodgs.

Picus pyrrhotis Hodgson, Journ. Asiat. Soc. Bengal, vi. 1837, p. 108: Nepal.

Hitherto only obtained by the present author at Doi Par Sakeng in north-western Siam.

Pyrrhopicus porphyromelas Boie.

Picus porphyromelas Boie, Briefe geschr. aus Ostindien, 1832, p. 143.

Stated by Robinson and Kloss (Ibis, 1911, p. 46) to be fairly common in the southern parts of peninsular Siam.

Meiglyptes jugularis Blyth.

Meiglyptes jugularis Blyth, Journ. Asiat. Soc. Bengal, xiv. 1845, p. 195: Arrakan.

Hitherto only obtained in northern Siam, where specimens have been collected at Pak Koh, Koon Tan, and Bang Hue Pong. Not common.

Meiglyptes tristis grammithorax Malh.

Phaiopicus grammithorax Malherbe, Monogr. Picidæ, ii. 1862, p. 12: Malay Peninsula.

Appears to be fairly abundant in the southern parts of peninsular Siam. Gairdner has met with it as far north as Sai Yoke in south-western Siam near the Tenasserim frontier.

Meiglyptes tukki Less.

Picus tukki Lesson, Rev. Zool. 1839, p. 167: Sumatra.

Hitherto only recorded from Ban Sai Kau, Biserat, and Jalor in the southern parts of peninsular Siam.

Micropternus brachyurus burmanicus Hume.

Micropternus burmanicus Hume, Proc. Asiat. Soc. Bengal, 1872, p. 70: Thayetmyo, Pegu.

Inhabits northern, north-western, and central Siam at least south to Bangkok. The present author also observed it on the Korat plateau in eastern Siam, but as no specimens were collected from there, it is impossible for the present to say if this or the allied *Micropternus brachyurus holroydi* Swinh., originally described from central Hainan, occurs there.

Micropternus brachyurus williamsoni Kloss.

Micropternus brachyurus williamsoni Kloss, Ibis, 1918, p. 107: Koh Lak, S.W. Siam.

Originally described from south-western Siam, but the specimens formerly recorded under the heading of *M. brachyurus* Vieill. from the southern parts of peninsular Siam most certainly also belong to this form.

Tiga javanensis intermedia Blyth.

Picus (Tiga) intermedius Blyth, Journ. Asiat. Soc. Bengal, xiv. 1845, p. 193: Burma.

The larger race of the Common Golden-backed Three-toed Woodpecker is rather abundant throughout the whole of Siam proper, being replaced in the most southern districts by the next form.

Tiga javanensis javanensis Ljungh.

Picus javanensis Ljungh, Kongl. Sv. Vetenskapsakad. Nya Handl. xvii. 1797, p. 134: Batavia, Java.

Replaces the foregoing in the southernmost parts of peninsular Siam. Authentic specimens collected at Bangnara and on the island of Puket.

Chrysocolaptes guttacristatus guttacristatus Tick.

Picus guttacristatus Tickell, Journ. Asiat. Soc. Bengal, ii. 1833, p. 578: Borabhum.

Inhabits northern and central Siam, where it is rather common. Southern limits of range still not properly ascertained.

Chrysocolaptes guttacristatus indo-malayicus Hesse.

Chrysocolaptes guttacristatus indo-malayicus Hesse, Ornith. Monatsber. xix. 1911, p. 182: Puket, S.W. Siam.

Replaces the foregoing in peninsular Siam, where, however, it appears to be rather rare.

Chrysocolaptes validus Temm.

Picus validus Temminck, Planches Col. Nr. 378 (♂), Nr. 402 (♀), 1825: Java.

Exclusively found in the southern parts of peninsular Siam, where it is stated to be common nearly everywhere.

Hemicercus concretus sordidus Eyton.

Dendropicus sordidus Eyton, Ann. & Mag. Nat. Hist. (1) xvi. 1845, p. 299: Malacca.

Found in the southern parts of peninsular Siam, though rather scarce.

Hemicercus canente Less.

Picus canente Lesson, Cent. Zool. 1830, p. 215: Pegu.

Generally distributed throughout northern Siam, though always rather scarce.

Mulleripicus pulverulentus harterti Hesse.

Mulleripicus pulverulentus harterti Hesse, Ornith. Monatsber. xix. 1911, p. 182: Upper Chindwin.

This large Woodpecker is generally distributed throughout northern and north-western Siam. It is, however, always rather rare. Also recorded from Pulu Lontar, Pulu Terutau, and Puket; but whether these islands are inhabited by this or the smaller typical race, *Mulleripicus pulverulentus pulverulentus* Temm., the type locality of which is Java, is still uncertain.

Thriponax javanensis javanensis Horsf.

Picus javensis Horsfield, Trans. Linn. Soc. Lond. xiii 1822, p. 175: Java.

Recorded as being rare in Trang. Also obtained on the island of Puket.

Thriponax javensis feddeni Blanf.

Mulleripicus feddeni Blanford, Journ. Asiat. Soc. Bengal, xxxii. 1863, p. 75: Burma.

Occurs throughout northern Siam, where it, however, is rather rare. In the British Museum (Nat. Hist.) there is also a specimen from Meklong in the central parts of the country.

Picumnus innominatus malayorum Hart.

Picus innominatus malayorum Hartert, Vög. der paläarkt. Fauna, Bd. ii. 1912, p. 937: Gunong Ijau, Perak.

Hitherto only obtained at Koon Tan in northern Siam. Apparently very rare.

Sasia ochracea reichenowi Hesse.

Sasia ochracea reichenowi Hesse, Ornith. Monatsber. xix. 1911, p. 181: S. Tenasserim.

Specimens belonging to this form have hitherto only been collected at Doi Par Sakeng in north-western and at Lat Bua Kao in eastern Siam.

Sasia abnormis abnormis Temm.

Sasia abnormis Temminck, Planches Col. Nr. 371, 1825: Java.

A southern form hitherto only obtained in peninsular Siam, where specimens have been collected at Trang, Bukit Besar, and Kao Nawng.

Iynx torquilla Linn.

Iynx torquilla Linnæus, Syst. Nat. Ed. x. 1758, p. 112: Sweden.

A winter visitor to Siam and extremely rare. Specimens have hitherto only been obtained at Bangkok and at Koon Tan. It is still uncertain whether the Siamese birds belong to the typical race or to the Chinese form, which has been separated by Hesse under the name of *Iynx torquilla chinensis* (Ornith. Monatsber. xix. 1911, p. 181).

Family TROGONIDÆ.

Pyrotrogon oreskios uniformis Rob.

Pyrotrogon oreskios uniformis Robinson, Journ. Fed. Malay States Mus. vii. 1917, p. 149: Lamra, Trang, peninsular Siam.

The Siamese and Malayan forms differ from typical *Pyrotrogon oreskios oreskios* Temm. from Java in having the back concolorous with the rump and upper tail-coverts. Fairly common throughout Siam, where it mostly occurs in the evergreen forests.

Pyrotrogon erythrocephalus erythrocephalus Gould.

Trogon erythrocephalus Gould, P. Z. S. Lond. 1834, p. 25: Rangoon, Burma.

The typical race of the Red-headed Trogon has hitherto only been recorded from eastern and northern Siam. It generally affects the evergreen forests.

Pyrotrogon erythrocephalus klossi Rob.

Pyrotrogon erythrocephalus klossi Robinson, Ibis, 1915, p. 735: Koh Chang, S.E. Siam.

Apparently exclusively found on the island of Koh Chang, off the western coast of south-eastern Siam.

Pyrotrogon diardi neglectus Forb. & Rob.

Pyrotrogon neglectus Forbes & Robinson, Bull. Liverpool Mus. ii. 1900, p. 34: Malay Peninsula.

Hitherto only met with in the southern parts of peninsular Siam.

Pyrotrogon duvauceli Temm.

Trogon duvauceli Temminck, Planches Col. Nr. 291, 1824: Sumatra.

Specimens of this form have only been recorded from Bukit Besar and Nawngchik in peninsular Siam.

Family Turnicidæ.

Turnix tanki blanfordi Blyth.

Turnix blanfordi Blyth, Journ. Asiat. Soc. Bengal, xxii. 1843, p. 80: Thayetmyo, Burma.

Our knowledge of the occurrence and distribution in Siam of the Button Quails is still very meagre. Authentic specimens of this form have hitherto only been obtained at Ok Yam in south-eastern Siam.

Turnix pugnax plumbipes Hodgs.

Hemipodius plumbipes Hodgson, Beng. Sport. Mag. 1837, p. 346: Nepal Valley.

Seems to be more common than the former species. Authentic specimens collected at Ban Sai Kau, Patelung, Bukit Besar, and Jalor (peninsular Siam), at Nakorn Chaisi and Raheng in central Siam. Also obtained on Puket, Koh Samui, and Koh Pennan.

[To be continued.]

XXII.—*Notes on South African Accipitres.*

By Lieut. C. G. FINCH-DAVIES, 1st S.A.M.R.

[Continued from p. 438.]

38. **Aquila wahlbergi** (Sund.). Wahlberg's Eagle.

I have not had much opportunity of observing this small Eagle, as I have only met with it within the last few years in the South-West Protectorate, where it does not seem to be very common. I have always found it in the Thornbush country, usually in pairs. The note is a clear plaintive whistle of two notes. I believe the prey to consist almost entirely of small mammals, lizards, snakes, and insects, and I have never known it to attack game-birds. I found two nests, both situated in inaccessible positions in the forks of high Camel-thorn trees. It appears to breed much later than most Eagles, as nests which were certainly occupied were found in December and January, *i.e.*, midsummer, whereas most of the larger birds-of-prey usually breed during the winter months, May and June. I have noticed a curious habit, in the manner in which the female bird approaches the eyrie. After circling round for some time at a great height above it, she would close her wings and drop like a stone till within a few feet of it, when, opening her wings and spreading her tail, she would check her impetus and alight gently on the eggs. Mr. C. H. Taylor, writing of this species in the 'Journal of the South African Ornithologists' Union,' as observed by him in Swaziland, noticed the same habit.

Sclater, following Sharpe, appears to have made a mistake in describing the young plumage of this species. He describes the young bird as having the sides of the head and neck and whole under surface white, with a few remains of bars on the flanks, under tail- and wing-coverts. To what species this description refers I cannot say, possibly to *Hieraëtus ayresi*; the same specimen is apparently figured in the background of plate 77 in the 'Transactions of the Zoological Society,' vol. iv., where the present species is figured under the name of *Aquila desmursi.* The figure in the foreground of the same plate more nearly represents the normal plumage of the young bird. I have seen several specimens. Two of these, in the Transvaal Museum, have the bases of the quills of the wings still in the sheath. These may be described as similar to the adult but paler; the tips of all the feathers of the upper surface rather paler. It would appear that these pale tips persist for some time as the bird progresses towards maturity, especially on the scapulars and wing-coverts, and I have seen specimens with all the feathers of the nape and back of neck with broad pale, almost whitish edges and tips. What I take to be the fully adult dress is a uniform deep sepia-brown with a purplish gloss. There is a very fine adult female in the Transvaal Museum in this dress shot at a nest in Swaziland.

I have here followed Gurney in placing this species in the genus *Aquila*, though Reichenow and some recent authors have changed it to *Hieraëtus*; but to me it does not seem rightly placed in the latter genus, as although in the possession of a small crest and in size it agrees with some of the species, the form of the bill and the coloration are different. I would suggest that it might best be placed among the Spotted Eagles, *A. clanga, pomarina, hastata,* etc.

39. **Aquila rapax** (Temm.). Tawny Eagle.

This is a rather common Eagle in the South-West Protectorate, the only part of South Africa in which I have met with it. It has always appeared to me to be a rather sluggish bird, spending much of its time perched on the top of some large thorn-tree from which it can command the surrounding country, and I have rarely seen it soaring. I have never seen it attack any kind of living prey, although no doubt it does kill hares and other small mammals as well as game-birds, etc., and also, when it gets the chance, sickly or wounded small antelopes, as described and figured by Millais in his 'Breath from the Veldt.' It is often a foul feeder, and I have often seen it feeding on carrion, and have caught some in traps baited with meat and set for jackals. One I shot had its bill and much of its plumage smeared with the grassy contents of the stomach of a buck or sheep.

The plumage is very variable, and scarcely two specimens are alike in this respect. The first plumage is undoubtedly the pale tawny one, which, before it is moulted, often becomes so much affected by bleaching and abrasion as to appear to be a dirty white, similar to the lower figure in Rüppell's plate of *A. albicans*. From this plumage it moults into a deeper tawny-rufous, the scapulars being dark brown with central paler streaks, but the wing-coverts and under surface unmarked with brown. As the bird gets older, dark edges appear to all the feathers of the head and neck, lesser wing-coverts, and sides of the breast. This is the most usual form of adult plumage, and is figured on plate v. of 'The Ibis,' 1865, figure in foreground. From this plumage onward I am inclined to think that the dark brown edges to the feathers gradually increase in width, the median rufous streaks becoming narrower, but I have only seen one South African killed specimen in which this has been carried to an extreme point: it is a mounted female in the Transvaal Museum, in which the dark brown has so far superseded the rufous that this specimen would be described as being dark brown all over, with rufous-tawny streaks on most of the feathers of both the upper and lower surface. I should say, however, that this stage of plumage was quite exceptional, and I have never seen another, nor have I ever read the description of such a specimen from South Africa, although in North Africa I believe such specimens are not so uncommon.

40. **Haliaëtus vocifer** (Daud.). African Sea-Eagle.

I have only met with this beautiful species in eastern Pondoland, where each of the mouths of the larger rivers appeared to have its pair of Sea-Eagles, and where, seated on some dead branch or snag projecting from the water, their snow-white heads and breasts contrasting with the dark green foliage along the banks, they looked very beautiful. They are very noisy birds, especially when nesting, and I have often listened to their wild clanging cry, which seemed to suit the surroundings. Their flight, although strong, always appears rather heavy, and it seemed to me wonderful that they were so successful in fishing, considering how clumsy their efforts appeared. I have often watched them beating about over the sea, just outside the line of broken water on the bars at the river mouths, then all of a sudden plunging with a heavy splash into the water, usually to appear with a large fish in their talons, which they would bear away to the nearest convenient perch to devour. Sometimes the fish they catch are so heavy that they have the greatest difficulty in carrying them to the nearest bank. The natives often chase them and make them drop the fish they have caught; and I once had to thank one for a fish of about 6 lbs. weight, which came in very handy for breakfast. Like Sea-Eagles the world over, they often rob the Ospreys of their fish, and Livingstone also stated that they robbed the Pelicans on the Zambezi, making them disgorge the fish from their pouches.

I have found two nests—in one case at the top of a very high and quite unclimable dead tree, the top of which appeared to have been blasted by lightning; the other in one of the forks of a large wild fig-tree, a big mass of sticks containing two white eggs.

The change from juvenile to adult plumage appears to be very gradual, and it no doubt takes some time to attain the fully adult state. The head and neck appear to be the first parts to show signs of the change, these parts and the breast becoming whiter at each succeeding moult; but the broad blackish streaks that are very conspicuous on the breast of the young bird appear to persist even when the rest of the plumage has almost assumed the adult colouring. There are at present several living immature birds in the Pretoria Zoological Gardens that show these breast-streaks in varying degrees of clearness.

41. **Buteo desertorum** (Daud.). Steppe Buzzard.

I have met with this species practically everywhere that I have collected in South Africa, with the exception of the coastal districts of eastern Pondoland. Although supposed only to occur in South Africa during the summer months, I have occasionally seen specimens in the winter, and I believe it sometimes breeds in South Africa. When stationed on the Natal border of eastern Pondoland, near the Ingela mountains, a pair used to frequent the neighbourhood of our camp, and, judging by their behaviour, I am certain that they were breeding, although I never succeeded in finding their nest: this was in June. I have nothing of any interest to record of the habits of this species. It is usually to be seen perched in some conspicuous position, such as a tall tree, fence, or telegraph-pole, on the look out for its prey, which consists for the most part of mice and rats and young birds; it will also take chickens.

Like most of the Buzzard family it is very variable in plumage, not so much in the juvenile, but principally in the adult dress. There appear to be two extreme forms of plumage, with intermediate phases; these may be called the dark brown form and the red form. Among the very large series in the Transvaal Museum there are two interesting specimens, showing these two extreme forms very well. A male from Grahamstown is of an almost uniform deep rufous colour below, slightly mottled here and there with paler colour and with a few streaks of dark brown; the tail bright rufous, with the usual bars. Another, a specimen labelled ♀, but probably ♂, from the Woodbush, Transvaal, is almost uniform deep brown below, mottled very slightly here and there with white and tawny rufous; breast and thighs uniform dark brown; the tail dark grey, tinged with rufous at the edges of the feathers, and barred as usual with black. Some specimens again, perhaps not very old birds, have a good deal of white on the under parts, usually forming a sort of band across the lower breast.

42. **Buteo augur** (Rüpp.). Augur Buzzard.

This is a rare species in South Africa, and, so far as I am aware, has only been recorded from Mashonaland and the South-West Protectorate. In the latter country I met with it for the first time, and only in the mountainous country in the Windhuk district. There I found it not very uncommon, and from what I have observed of its habits, it appears to exactly resemble the Jackal Buzzard (*Buteo jakal*). It is found in the same kind of country, and has just the same flight and cry. I found two nests, both in the same sort of position, *i.e.* built in the forks of small trees standing out from steep mountain-sides, which in shape and composition exactly resembled nests of *B. jakal.* They were composed of sticks, lined with grass, a little sheep's wool, and a few green leaves. One was empty, but as the owners were flying round in a rather excited manner, I expect they were about to lay. The other, found on the 4th of June, 1918, contained two eggs, which were much incubated, of a rather rough chalky texture, subspherical in shape, white in colour, slightly spotted with reddish brown, and with large blotches of the same colour at the blunt end. One I smashed in trying to extract the embryo ; the other measures 63·5 × 53 mm., and is now in the Transvaal Museum.

Claude Grant has discussed the various plumages of this species very fully in 'The Ibis,' 1915, and I have nothing to add to the information given there, except to note that I have never seen a specimen of the uniform black form from South Africa, all I have met with having been white-breasted birds. The young also have the under parts white, streaked on the sides of the breast and flanks, and slightly barred on the latter, with dark brown.

43. **Buteo jakal** (Daud.). Jackal Buzzard.

This is a common bird all over eastern Pondoland and East Griqualand, and scarcely a day would pass in those parts without several having been seen or heard, especially heard, as it is a very noisy bird, particularly in the breeding season, when its far-reaching, jackal-like cry may be heard everywhere among the kloofs and hillsides. It is a frequenter of somewhat mountainous or broken country, and in Pondoland its favourite haunts are the steep hillsides and cliffs bordering the river valleys. Although the bird is a denizen of rocky places, I have never found a nest actually in a cliff, although I believe it sometimes builds in such places. All the nests I have found have been in the forks of trees projecting from the steep hillsides. It has a very fine and buoyant flight, and is often to be seen soaring at a great height, its clear call coming down from the clouds, where the bird appears like a speck in the sky. When a strong breeze is blowing I have often seen it hunting, poised head to wind, something after the manner of a Kestrel, but without the quick beat of the wings, which are somewhat flexed at the carpal joint and almost motionless, while the eyes are bent on the ground below. After remaining like this for a short time, and seeing no prey, it would sail off down wind a short distance and then bring up again head to wind a little farther off, and so on until a mouse or rat was observed below, on which it would drop and bear off to the nearest perch to eat. I think that, on the whole, this must be a very useful bird, as it preys principally on rats and mice, together with lizards, locusts, etc. It, however, occasionally takes to killing chickens, and on one of my stations, a pair, which had a nest not far away, used to rob me of a young chicken daily, until in self-defence I had to shoot the male bird.

I have nothing much to record with regard to plumage-changes. The young have been often, and correctly, described. Their plumage becomes very pale and worn before the adult state is gained. Traces of immaturity are usually to be seen in a certain amount of rufous mottling on the mantle, when the bird is in otherwise adult plumage. Amongst adult specimens the colouring of the under parts is subject to a good deal of variation: thus some have these parts almost entirely rufous and black, in others there is often a good deal of white, especially on the chest. The tail-bar also varies a good deal; in some specimens there is almost a perfect bar across all the feathers, in others it is only represented by a dark spot on each feather: perhaps this is a question of age. In fresh plumage there is a beautiful pearly bloom over all the feathers, similar to that seen in many of the Heron family, giving a slate-grey appearance to the plumage, which is really almost black.

44. **Milvus ægyptius** (Gmel.). Egyptian Kite.

A very common bird in eastern Pondoland during the summer months, but in the adjoining districts of East Griqualand it seemed to be rather scarce, and those I saw were only migratory. In the South-West Protectorate, and still more in Ovamboland, I found it exceedingly common, especially in the latter country, where, during a punitive expedition in which I took part, large numbers were always to be seen circling about our camps, or perched on the surrounding trees, and nearly every large tree in the vicinity of a native village contained one or more nests. They were most remarkably bold, often swooping down amongst the men and natives round the cooking-fires, to pick up scraps of meat, etc. In eastern Pondoland I have noticed the bird usually hanging about the villages and native kraals and doing the work of a general scavenger; but in addition to this it takes what living prey it can catch, such as mice, rats, insects of various sorts, while it is also very destructive amongst chickens. After rain, when the winged termites are leaving their nests, I have seen numbers of Kites collect to feed on them, swooping about through the insects with their graceful flight, seizing the termites in their feet and transferring them to their bills.

I have nothing to record as regards plumage-changes.

45. **Milvus migrans** (Bodd.). Black Kite.

The Black Kite is a rare bird in South Africa, and very few specimens have been collected. I have never met with it, and have nothing to record with regard to its habits or plumage-changes.

46. **Elanus cæruleus** (Desf.). Black-shouldered Kite.

I have found this species fairly common in every part of South Africa where I have collected, but, perhaps, scarcer in the South-West Protectorate than elsewhere. Although usually seen singly or in pairs, I once came across a flock of twelve, perhaps collected for purposes of migration of some sort. Each pair seems to have its recognised beat and favourite perches, where they may be found regularly at certain times. Its mode of hunting almost exactly resembles that of the common European Kestrel: hovering on quickly-beating wings at no great height above the ground until it spots its prey, which may be a mouse, grasshopper, or beetle or other insect, it then descends on it with a gentle glide, not a quick dash. It is a fearless little bird, and I believe extremely useful, feeding almost entirely on insects of various sorts, and occasionally on rats and mice. Where they are permitted, a pair will generally take up their residence amongst the trees near a farmhouse, and no doubt prove very useful, while they are certainly very ornamental. Unfortunately, they are sometimes accused of killing chickens, and shot in consequence; personally I have never heard of an authentic case of chicken-killing, but many people seem to have a fixed idea that because a bird is a hawk it must be destructive and therefore to be shot on sight. We have only to observe the attitude of other birds towards this species, to note how little it is feared by them. I have often seen Weavers and other small birds sitting within a few feet of them, even on the same branch, and showing no fear whatever.

I have nothing to record with reference to plumage-changes, except to mention a curious albinistic specimen in the Transvaal Museum. This specimen, an adult male, is almost entirely white, with the following exceptions: three primaries in the left wing are normally coloured, a few grey feathers appear on the scapulars, the crown of the head and upper mandible are pale grey, and there is a grey tinge on the sides of the breast. The soft parts are normal.

47. **Machærhamphus anderssoni** (Gurney). Andersson's Pern.

I have never met with this rare species, and have nothing to say about habits or plumage. The only South African Museum which possesses specimens is that in Durban, where, as I understand from the Director, there are two specimens, shot near that place. I have not so far been able to examine these specimens.

48. **Pernis apivorus** (Linn.). Honey-Buzzard.

I have not met with the Honey-Buzzard in South Africa, where it appears to be rare. All the South African killed specimens I have heard of have been either young or immature birds.

So much has already been written by Gurney, Dresser, and others on the extremely variable plumage of the young and immature birds of this species, that it is not necessary for me to do more than mention the matter here. I would like to draw attention to a rather curiously coloured specimen shot by Mr. Austin Roberts of the Transvaal Museum, in his garden in Pretoria. In this specimen the whole of the head, neck, and under parts are of a buff colour, each feather with a dark slate streak; there is a dark moustache-mark on each side of the throat. The rest of the upper surface is more or less normal, except that each feather is tipped with buff, and the wing-coverts are particoloured, the outer web dark brown, the inner buff-coloured. The tail-bars are somewhat distorted and the forehead is white. A very similar coloured specimen of *P. ptilorhynchus* is figured by Schlegel in his 'Volk Vogels etc.'

49. **Baza verreauxi** (Lafr.). South African Cuckoo-Falcon.

I have found this species not uncommon about the bush and forest country in eastern Pondoland, but owing to its habit of usually being found in rather thick cover, I have not been able to observe much of its habits. Judging by the contents of the stomachs of those I have shot, they feed almost entirely on insects, and I have never found bird or mammal remains. On one occasion, very early in the morning, in fact just after daybreak, I came across a party of five of these birds, probably the two parents with their young. They were hunting, slowly, over a grassy flat near a patch of forest. Their manner of hunting rather reminded me of that of some of the Kestrels, especially *Erythropus amurensis*. Flying slowly along, head to wind, in more or less of a line, not very high above the ground, they kept on settling on the ground and picking up something. After watching them for some time I succeeded in shooting one, and found its crop to contain a mass of small grasshoppers and a single Mantis. This species has a very strong musky smell, which is apparent in skins for some time. One or two immature birds I have shot have been swarming with lice.

Judging by a number of skins I have examined, this species seems, in some cases at least, to pass through an intermediate stage of plumage between the young and the adult. In the Transvaal Museum there is an immature specimen showing feathers belonging to three distinct plumages. The first and second of these are very similar as regards the colouring of the upper parts. In the first the under parts are white, marked on the throat, breast, and abdomen with dark brown streaks and drop-shaped spots; on the flanks these markings assume a more bar-like shape. In the next plumage the throat and breast are white, marked with broad almost spade-shaped spots of pale rufous brown, the spots being so large that they predominate over the white. The flanks, abdomen, and under tail-coverts are buffy white, with heart-shaped spots of rufous brown outlined with darker brown. From this stage the bird moults into the adult plumage. There is some difference in tint in the colouring of the upper surface in adults; some are of so dark a grey as to be almost black, others much paler. I have seen certain specimens, notably a male from King William's Town, in which the bars on the under surface, instead of being rufous edged with dark brown as is usual, are almost uniform, the dark brown edges predominating over the rufous.

50. **Poliohierax semitorquatus** (Smith). African Pigmy Falcon.

I have met with very few specimens of the Pigmy Falcon, and know very little from personal observations of its habits. The only part of South Africa where I have met with it is in the South-West Protectorate, where it is far from common. It appears to be a rather tame little bird. One I saw was sitting on a branch of a low thorn-tree close to the road, eating what looked like a large grasshopper, and took little or no notice of me as I rode past within a few yards of it. Neither Sharpe nor Sclater gives any description of the young of this species. These, both male and female, resemble the adults in plumage, but the grey parts are a good deal suffused with rufous owing to the edges of most of these feathers being more or less rufous. The flanks are buffy white with streaks of pale brown or grey; the tips of the feathers of the secondaries, median wing-coverts, and tail are bright rufous.

51. **Dissodectes dickinsoni** (Sclater). Dickinson's Kestrel.

I have never met with this species, and have nothing to note with regard to habits or plumages. There appear to be no juvenile specimens in any of the South African museums.

52. **Tinnunculus rupicolus** (Daud.). South African Kestrel.

This is, I should think, the commonest Hawk in South Africa, and is to be found everywhere in suitable localities, that is, wherever rocky hills or cliffs occur. It will also, however, often take up its residence in the steeples of churches or other suitable buildings in towns. In Windhuk, in the South-West Protectorate, a pair used to breed regularly on the Government Buildings, making their nest at the top of one of the large columns. When left in peace it is a tame bird, and often to be seen about farms, where it is most useful in killing off rats and mice, besides locusts and other harmful insects ; but few farmers acknowledge its usefulness, while they accuse it, as they do every other hawk, of destroying their chickens. In my experience it lives almost entirely on small mammals and insects, and I do not remember to have ever seen one kill a bird of any kind, while most small birds appear to have little fear of it. When breeding it is very bold and fearless in the defence of its nest, and will dash out and drive away any large bird that is approaching. In general habits it almost exactly resembles our English Kestrel, but I do not think it hovers so much as that species when hunting, but takes up a position on some telegraph-pole or large rock or tree from which to look out for its prey.

Judging by an examination of numerous specimens, it would appear that the full adult plumage is assumed somewhat gradually, the grey head often shewing a shading of brown in immature specimens, and immature males often shewing traces of bars on the grey tail.

53. **Tinnunculus rupicolus rhodesi**, subsp. nov. Matopo Kestrel.

Similar to *T. rupicolus rupicolus*, but much smaller and paler in colour both above and below, and differing especially in the dark spots on the upper surface being much reduced in size: on the upper mantle they are mere pin-points, while in the male type they are altogether wanting from the smaller lesser wing-coverts.

This race, which I have named after the late Mr. Cecil Rhodes, whose grave lies in the hills which the bird frequents, appears to be very distinct. The type specimens, an adult ♂ and ♀, in the Albany Museum, Grahamstown, are from the Matopo Hills, Rhodesia. I have also examined another adult ♀ from Bulawayo, in the Rhodesian Museum. I have compared these specimens with a large series from other parts of South Africa, and the distinctions I have noted are very noticeable, especially the small measurements and the remarkably small size of the spots. I give below the wing-measurements of the three specimens mentioned above, and two of the typical race shot by myself in East Griqualand.

Wing-measurements.

T. rupicolus rupicolus	♂ 9¼″	♀ 10″.	E. Griqualand.
T. rupicolus rhodesi	♂ 9″	♀ 9½″.	Matopo Hills.
		♀ 9¼″.	Bulawayo.

I would also note that Mr. Austin Roberts, of the Transvaal Museum, who examined these specimens some time ago, was apparently struck by these distinctions, as he has made a note on the labels, "sub-sp. nov.", but as he has not named or described them I have taken the liberty of doing so.

54. Tinnunculus rupicoloides (Smith). Large African Kestrel.

This is a bird of the drier parts of South Africa, and I have only met with it in the South-West Protectorate, where it is not uncommon in some parts. It is, for a Kestrel, a somewhat sluggish bird, spending a good deal of its time perched on the top of some thorn-tree, telegraph-pole, or other conspicuous position, from which it looks out for its prey, swooping down on it and then returning to its perch to eat it. I cannot remember to have seen this species hovering in the way the European, and to a less extent the common South African Kestrels do, but its food is much the same, small rodents and insects of various sorts. I have nothing to note with regard to plumage-changes. This is the only true Falcon I know which has a pale-coloured iris; in the adult it is either white or pale yellow.

55. Tinnunculus cenchris (Naum.). Lesser Kestrel.

Tinnunculus cenchris pekinensis? (Swinhoe).

I have sometimes found this species very common in the parts of South Africa where I have been, but never met with it in eastern Pondoland. In East Griqualand it was very common during the summer months, but more so in some years than in others. In the South-West Protectorate I very seldom saw it, but on one occasion, in March 1916, when travelling by train from Tsumeh, in the north, to Windhuk, I saw numbers sitting along the telegraph-wires, and others flying in a northerly direction. At Mataticle in East Griqualand I had good opportunities of observing the habits of this species, as large numbers used to frequent the vicinity of the camp and were to be seen there daily. When the day was still, with little or no breeze blowing, they were to be seen sitting all along the telegraph-wires, watching the ground below, and descending on any prey they might see; but when a breeze was blowing they seemed to prefer to hunt in the air, and would be then seen quartering the surrounding veldt, hovering for a few moments here and there and sometimes swooping down to the ground to pick up some grasshopper or other insect. Their food consisted entirely of insects of various sorts, the smaller ones eaten on the wing, the foot holding the insect being brought forward to the bill, which was bent downwards to receive it. It is very pretty to watch them hawking after the winged termites, seizing them in their feet in flight, and rarely missing them.

With regard to plumage-changes, I would note that Sclater says that during the change from juvenile to adult plumage of the young male, "the blue tail is gained by a moult, but the blue head by a change of feather," by the latter apparently meaning that the feathers change colour without moult. I fear I must dissent from this view—first, because I am not amongst those who believe such a thing possible, having, during an observation of some twenty-five years or so, never come across a case of anything approaching it; and, secondly, I have frequently met with young males which had new *blue* feathers appearing among the old rufous and black-streaked feathers of the young plumage. On the other hand, I have met with several immature specimens which might lead one to suppose that the colour of the feathers was changing from rufous to grey, as all the grey feathers of the crown were suffused with rufous. I, however, believe these specimens to be somewhat abnormal, retaining some of the rufous coloration on the head *after* the moult, as all the feathers were equally fresh and not worn in any way. I secured a somewhat abnormal specimen myself in East Griqualand. This specimen had just completed its moult into adult plumage, but instead of the head being of a uniform blue-grey, it was streaked with black as in *T. rupicolus*, while the dark spots on the under surface were larger and more numerous, and also several of the scapulars had a slate-grey subterminal spot ; in fact, the bird in some ways gave me the impression of an aberration in the direction of *T. arturi* (Gurney). I am inclined to think that in this species the spots on the under surface disappear with age ; in some specimens they are very small, in others there are only two or three on the flanks, and in the Transvaal Museum there is one very fine specimen, a typical *T. cenchris* in every other respect, with no sign of spots on the under surface.

I am not sure whether the eastern form of this species, *T. pekinensis* of Swinhoe, is still recognised by ornithologists, but if it is, then many South African specimens appear to be referable to this race, as already noted by the late Mr. J. H. Gurney, sen., in his 'Notes' and also in Appendix "M." to his 'List.' There are two or three more or less typical specimens in the Transvaal Museum, and I think it is quite possible that the eastern race may accompany *Erythropus amurensis* in its migration to this country. For the benefit of those who are not aware how *T. pekinensis* may be distinguished from the typical race, I might mention that Swinhoe stated that it differed in the following particulars, *i.e.*, the mantle and scapulars of a deeper shade of rufous, the under parts without spots, and the greater part of the upper surface of the wing, secondaries, greater, median, and lesser coverts, uniform grey. Of these three points, as pointed out by Gurney, the only one that appears to hold good is the coloration of the wing-coverts.

56. **Erythropus vespertinus** (Linn.). Red-legged Kestrel.

This species appears to be rather rare in South Africa on the whole, and although Andersson recorded it as occurring in Damaraland in vast flocks in his time, I never met with it there, but there is an adult ♀ specimen in the Transvaal Museum from Windhuk, and another specimen, an adult ♂ from the Pretoria district. These are the only South African localities I know of.

57. **Erythropus amurensis** (Radde). Eastern Red-legged Kestrel.

I have only met with this species in East Griqualand, where it was not uncommon in certain years. I did not meet with it in the South-West Protectorate, but saw a specimen of a young male shot by my friend, Major Thompson of the S.A.M.C., at Tsumeb in the north of the Protectorate. I have often noticed these associating with *T. cenchris*, and much resembling the latter species in general habits, except that I never saw them hovering and their flight is quicker, more dashing, and falcon-like. I once observed a flock which were feeding on some cockchafer-like flying beetles, dashing about and generally behaving much like huge Swifts. At other times I have seen them in the native corn-lands sitting on the heads of the late ripening corn (millet), occasionally flying off and seizing passing insects after the manner of a Flycatcher. One evening fairly late, I saw a number settled in the middle of a road running about and picking up some objects or other, perhaps termites. They appear most active fairly late in the afternoon, and are often still flying about when it is nearly dark. I have nothing to note with regard to plumage-changes.

58. **Hypotriorchis subbuteo** (Linn.). European Hobby.

I have not met with the Hobby in South Africa, where it never appears to be common, while most of those which visit South Africa on migration appear to be young birds, and I have never seen an adult South African killed specimen.

59. **Hypotriorchis cuvieri** (Smith). African Hobby.

This is a rare species in South Africa, and the only specimens in any of the South African Museums appear to be an adult and a young male in the South African Museum at Cape Town.

60. **Chiquera ruficollis** (Swains.). Red-necked Falcon.

This is another somewhat rare species in South Africa. I have personally only met with three specimens, all in the Windhuk district of the South-West Protectorate, and I have nothing to record with regard to its habits. One of the specimens mentioned above, an adult male, which I secured, had in its crop the remains of a small bird.

A few years ago Mr. Austin Roberts described, in the 'Annals of the Transvaal Museum,' a new Falcon under the name of *Falco horsbrughi*, from two specimens shot by Mr. C. B. Horsbrugh in the Pretoria district of the Transvaal. In my opinion this Falcon, of which I have examined the type specimens in the Transvaal Museum, is only *C. ruficollis* in the young plumage, as it agrees very well with Sclater's description of that plumage, and also with the description given by Gurney in his 'Notes.' In order to try to elucidate the matter I made careful drawings of the type specimens and sent them home to Mr. Ogilvie-Grant, asking him to compare them with specimens in the British Museum. This he very kindly did, and informed me that they were absolutely identical with young specimens in the Museum. However, Mr. Roberts still upholds his opinion that his species is distinct, basing this on the fact that his specimens were shot in the vicinity of a nest containing young in down. He believes that they were the parents and therefore adult. Secondly, the wing-measurement is somewhat larger. It is possible that *F. horsbrughi* may yet prove to be distinct, but for the present I prefer to treat Mr. Roberts's name as a synonym of *C. ruficollis*.

61. Falco peregrinus minor (Bon.). South African Peregrine Falcon.

In my experience this is a rather scarce species everywhere. Shortridge in his notes on the birds of Port St. Johns in eastern Pondoland, in 'The Ibis,' stated that it was common in that district, but although he procured a specimen, I am of the opinion that he must have confused this species with *F. biarmicus*, as I spent some eight years collecting in eastern Pondoland, while I only secured a single specimen and saw one other. I never met with it in East Griqualand, but saw a few in the South-West Protectorate, one of which I secured. It is a most beautifully shaped little Falcon, and I should think if trained would prove a fine game-hawk. Nearly all I have seen have been in pursuit of some bird or other. A fine adult male which I shot in Pondoland had just stooped and picked up a Quail, which I had missed; another I saw make a most determined stoop at a Hadadah Ibis, which only just escaped, shrieking with fear and dropping like a stone into a reed-bed. On the border of the Etosha Pass in Ovamboland I saw one pursuing a flock of Ruffs. Another I saw make a dash at a flock of Doves, which escaped into some trees. Again, near Windhuk, a friend of mine made a very lucky right and left, killing with the right barrel a Rock Pigeon, and with the left a beautiful male of this species, which was in pursuit of the pigeon.

I have not been able to examine a large enough number of specimens to state anything definitely, but it has seemed to me from the examination of a fair number of both sexes that there is a distinct difference in this respect: this is principally noticeable in the colouring of the under parts, which, in females, always resembled the plate of this species in Sharpe's Catalogue. That is, the under parts were always rufous and buffy-white, barred with black or dark brown, without any trace of grey. All males have had the under parts, especially the flanks and tibial plumes, more or less grey, barred with black. With one exception, all the males I have seen have had the throat and breast creamy-white, the latter with small spots of black. The one exception is the male already mentioned as shot at Windhuk. This specimen had the breast of a dark salmon-buff, without a sign of spots, and only a few spots on the abdomen. Gurney states in his 'Notes' that he has never seen a specimen with any rufous tips to the feathers of the hind neck, such as are usually present in *F. barbarus*. I have, however, seen two adult females which showed distinct rufous tips to these feathers.

As regards the occurrence of *Falco peregrinus* in South Africa, Gurney at various times recorded in 'The Ibis' Falcons from South Africa as belonging to this species, but I have been unable to find out whether these were correctly identified. Gunning and Haagner in their Check-list include *F. peregrinus* on the strength of an adult in the Transvaal Museum from Grahamstown. I have examined this specimen, which is undoubtedly an adult male of *F. minor*. Later Mr. Austin Roberts, in the 'Annals of the Transvaal Museum,' referred a young mounted specimen in the museum to *F. peregrinus*. This I also believe to be referable to *F. minor*. So that at present I do not consider that *F. peregrinus* can be included in the South African avifauna.

62. Falco biarmicus (Temm.). South African Lanner Falcon.

This is a common Falcon in South Africa, and I have met with it practically everywhere, but mostly in the more open parts where there are suitable cliffs for breeding and not too much bush about. It is a game-killing Falcon, taking its prey, which consists principally of birds of various sorts, such as pigeons, quails, partridges, etc., in the true falcon manner, either by a swift stoop from a great height, or else in a stern chase. It is a bird of very powerful and swift flight, as is shown by the fact that I saw one chase and finally catch a full-grown Rock Pigeon, which is one of our strongest and swiftest fliers, and a bird which would tax even the powers of the European Peregrine. During the summer months, when the Quail are here, the Lanners seem to be more in evidence than ever, and when out Quail shooting one or more are sure to turn up, and 'wait on' above in the hopes of picking up a Quail or two that has been flushed and missed. This habit is taken advantage of by the native boys, who, accompanied by their dogs, beat through the corn-lands, but before doing so, give a peculiar call to attract the Falcons, which are sure to be about. These then 'wait on' above while the boys and the dogs hunt through the stubble. When a Quail rises the boys throw their sticks; if they miss, one of the Falcons stoops, and frequently misses the Quail, which drops like a stone into the nearest cover, in which case nothing will induce it to rise again, and is either caught by the dogs or picked up by the boys.

My friend, Mr. B. R. Langford, late of the Irrigation Department at Pretoria, had some of these Falcons in training before the war. One of these, a Tiercel named "Robin Hood," which he had for about three years, turned out very well, and gave some good flights; but it would appear from what Mr. Langford told me, that these Falcons cannot compare with the European Peregrine as a game-hawk.

I have nothing much to record with regard to plumage, except to draw attention to an abnormally coloured young bird, described and figured by Mr. Langford in the 'Journal of the South African Ornithologists' Union.' This appears to have been a somewhat albinistic form, the under parts being normally coloured, but the upper parts more or less mottled and barred with whitish. Adults of this species often have a few greyish bars and spots on the flanks and tibial feathers.

63. **Pandion haliaëtus** (Linn.). Osprey.

I have only met with Ospreys at the mouths of some of the larger rivers in eastern Pondoland, where they are far from common, not more than a pair of birds being found on each river. Their habits in South Africa seem exactly the same as in other parts of the world, and I have already alluded to the way in which the Sea-Eagles rob them of their prey. I have never met with a nest, and so far as I am aware, there is no record of the bird having bred in South Africa. I have nothing to record with regard to plumage-changes.

[Concluded.]

XXIII.—*Notes on the Birds of North-East Chihli, in North China.* By J. D. D. La Touche, C.M.Z.S., M.B.O.U.

A fairly full description of the port of Chinwangtao, in north-east Chihli, China, where the bulk of the following notes were written, having already appeared in 'The Ibis' (1914, p. 560), it is unnecessary to revert to the subject, except to mention that, since that time, Chinwangtao has been extensively planted with acacias. These trees having formed thick woods, impenetrable in summer and autumn, the observation of new arrivals is now more difficult than when the sandhills were bare. The only clear ground at present is along the cliffs above the beach. The planting of trees had not induced birds to nest when I left Chinwangtao, probably on account of the want of water. In time, however, the trees should cause permanent dampness and the formation of pools in certain parts, and this should induce birds to linger and eventually breed there.

A visit to the mountains north of Chinwangtao in the autumn of 1916, enabled me to ascertain that they are covered in certain parts with new woods; but large timber is practically non-existent, and the scarcity of birds at the time of my visit was very marked. *Corvus levaillanti*, Magpies (only too abundant), *Urocissa erythrorhyncha*, Jays and Choughs, a few common Tits, *Pterorhinus davidi*, *Rhopophilus pekinensis*, *Emberiza leucocephala*, *E. cioides,* some Green and Spotted Woodpeckers, a few Hawks and Pheasants, and Chukore were almost the only birds noticed. Further to the west and north-west, towards the Tungling and the Imperial Hunting park, where the country has unfortunately been handed over to a Vandal peasantry, the few remaining forests shelter many interesting species. It will not be long, however, before the last of these accessible forests disappears and takes away with it the fauna that even now is on the verge of extinction.

I am greatly indebted to Mr. A. de C. Sowerby, late of Tientsin, and to the Rev. Geo. D. Wilder, of the American Board of Missions, Péking, for important and invaluable information on Chihli birds and for the loan or gift of specimens; to Father Scherjon, of the Dutch Lazarist Mission, for his kind assistance in procuring me specimens from the Chien An district (about fifty miles as the crow flies to the west-north-west of Chinwangtao) through a native hunter; and to Fathers Schmid and Dekkers, of the same mission, for information regarding the geography of the interior, for their kind hospitality, and for the loan of their residence on two occasions. My best thanks are also due to Mr. W. R. Ogilvie-Grant, late of the Natural History Museum, and to Dr. E. Hartert for kindly identifying a number of specimens for me, and to Lord Rothschild for the use of the collections at Tring.

In the following notes, which are a summary of those made at Chinwangtao from November 1910 to October 1917, I have as a rule restricted references to David and Oustalet's 'Oiseaux de la Chine' and to my previous paper on this part of China.

1. **Corvus corone orientalis** Eversmann.

Corvus corone David & Oustalet, Les Oiseaux de la Chine, p. 368: La Touche, Ibis, 1892, p. 429; Bull. B. O. C. vol. xxix. p. 132.

Corvus orientalis La Touche, Ibis, 1914, p. 566.

The first Chinese examples of the eastern Carrion Crow were taken at Foochow in 1884, previous to which date the bird had been found by Swinhoe at Naochow Islands, near Hainan, but had not been obtained there or elsewhere in China, unless the specimen recorded by Père Courtois as shot in Kiangsu by Père Heude and preserved in the Sikawei Museum be of anterior date (Ibis, 1907, p. 510). One example was taken at Shaweishan on the 23rd of March, 1911, by the collectors sent there by me on behalf of the Migration Committee of the British Ornithologists' Club. This Crow is a regular migrant at Chinwangtao in late autumn. It also passes in the early spring, and I have occasionally seen individuals in winter which were undoubtedly of this species. It is quite evident that a fair number pass down the coast to winter in the maritime provinces of China; but, beyond Père David's statement that he had seen Crows on the western borders of China which he thought were Carrion Crows and the record of two examples obtained in west Szechuan by the late Mr. W. R. Zappey (Mem. Mus. Comp. Zool. Harvard College, vol xl. no. 4, 1912, p. 197), nothing seems to be known of the movements of the bird in the interior. At Chinwangtao the birds may be seen migrating in small parties, and flying in scattered order from east to west, during late October and in November.

The wing in three male examples shot at Chinwangtao measures 13·60, 14·00, and 14·50 in., and in one female 13·20 in. A male and a female, apparently young birds, shot on migration on the 2nd of November, 1916, have wing-measurements of 12·70 and 12·30 in. respectively.

2. **Corvus macrorhynchus levaillanti** Less.

Corvus sinensis D. & O. p. 367.

Corvus levaillanti La T. p. 566.

The Chinese Jungle-Crow is a somewhat rare migrant at Chinwangtao. It appears to be common enough as a resident in the mountains north of the port, where I saw two or three pairs established in the vicinity of the hamlet where I was staying in October 1916. Each pair had a valley to itself.

Two eggs taken about the 9th of May, 1917, in the above-mentioned locality, measure 1·75 × 1·18 and 1·70 × 1·18 in. The ground-colour is pale greenish blue and the markings are somewhat scanty. A live nestling obtained from the same mountains on the 15th of July, 1917, had the mouth coloured bright crimson and the irides blue. When the bird became full-grown these parts changed to the normal colour of the adult.

3. **Corvus frugilegus pastinator** Gould.

Frugilegus pastinator D. & O. p. 369.

Corvus pastinator La T. p. 567.

The Eastern Rook passes north-east Chihli from the end of February and throughout March to the end of April, and again in immense flocks in October and November. Inland, nest-building begins at the beginning of April. A rookery, which at the beginning of May was fully inhabited, was found deserted on the following 19th of June. In 1914 the Rooks built at the port itself for the first time. The nests were begun about the 15th of April, and the last were mostly finished about the 6th of May. In 1915 the birds attempted to build on the 3rd of May, but the first nests being destroyed, they left and did not reappear. During the two following years, large rookeries were successfully established in two or three spots at the port.

4. **Corvus dauricus** Pallas.
Lycos dauricus D. & O. p. 370.
Corvus dauricus La T. p. 567.

The Daurian Jackdaw appears at Chinwangtao towards the end of February or beginning of March, and may be seen migrating throughout the latter month. It passes again in autumn with the Rooks in great numbers.

5. **Corvus neglectus** Schlegel.
Lycos neglectus D. & O. p. 370.
Corvus neglectus La T. p. 567.

Swinhoe's Jackdaw passes commonly from the middle of March until May, and apparently tarries occasionally till the end of that month, as a party of ten were observed on the 25th of May, 1913. This confirms Père David's observations. I do not know whether any breed in the district. In autumn this Jackdaw is seen mixed with the flocks of Daurian Jackdaws and Rooks. During both seasons it is much less common than the pied bird, but flocks entirely composed of Black Jackdaws are not at all unusual. Hybrids are common. The wing-measurements in my series of Jackdaws are as follows:—

C. dauricus	♂ 8·83 – 9·43,	♀ 8·45 – 9·00 in.
C. neglectus	♂ 8·71 – 8·93,	♀ 8·34 – 8·65
Hybrids	♂ 9·00 & 9·35,	♀ 8 50 – 8·85

6. **Fregilus graculus brachypus** Swinhoe.

Fregilus graculus var. *brachypus* Swinhoe, P. Z. S. 1871, p. 383.

Fregilus graculus D. & O. p. 371 (part).

Seven examples of the Short-toed Chough, obtained in the mountains near Chinwangtao, measure as follows:—

Five males.

Wing	11·15–11·80 in.	Average	11·47 in.
Tarsus	1·75– 1·90	,,	1·83
Middle toe without claw	·94– 1·15	,,	1·02
Bill	1·90– 2·05	,,	2·00

Two females.

Wing	10·05 10·80 in.
Tarsus	1·65– 1·72
Middle toe without claw	·85– 1·00
Bill	1·85– 2·00

This bird is a common resident in the mountains of north-east Chihli. A pair seen on the 2nd of May had probably a nest with young. Two eggs, taken by a native from a hole in the Great Wall about the middle of April 1917, were a good deal incubated. The ground-colour of these eggs is white, and this is marked all over with specks or irregular medium-sized spots of reddish brown over violet-grey spots, the latter on the surface as well as within the shell. There is a zone round the large end of the eggs. The shape is ovate. They measure 1·54 × 1·05 and 1·47 × 1·06 in.

7. **Nucifraga caryocatactes macrorhynchus** Brehm.

Nucifraga caryocatactes D. & O. p. 372.

Nucifraga leptorhynchus Seebohm, Ibis, 1888, p. 236.

The Eastern Nutcracker inhabits Chihli, but is very rare according to Père David. Two undoubted migrants were shot in this vicinity in October 1911, one of which is in my collection. I have another specimen shot in the Chien An district in April 1912. This bird is a female in very pale (probably faded) plumage.

♂. Wing 7·30 in.; white on outer rectrix 1·30 in.

♀. Wing 6·90 in. (worn); white on outer rectrix 0·90 in.

8. Pica caudata sericea Gould.

Pica caudata D. & O. p. 373.

Magpies are, as elsewhere in China, very abundant. In November they associate in large flocks, and probably many wander down to the south-west, as the birds which frequented the port at that season had the appearance of travelling birds.

I am unable to see any notable difference between the Magpies of this part of Chihli and those from Foochow in south-east China, except that there is perhaps a little more white on the primaries on average in the northern birds.

Early in March 1917 a large party of Magpies appeared at the port and remained throughout the spring. One pair remained to breed. I received fresh eggs on the 11th of May from the mountains north of Chinwangtao.

9. Cyanopica cyana interpositor Hartert.

Cyanopolius cyanus D. & O. p. 374, pl. 84.

Cyanopica cyanus interposita Hartert, Nov. Zool. vol. xxiv. p. 493, Dec. 1917.

The north China Azure-winged Magpie appears to be common in the Chien An district, from which locality I have several examples. It is abundant in the plain round Peking, but I have only seen one specimen from the Chinwangtao country, which was shot at the beginning of June 1917, about 30 miles north of that port.

Specimens from Chien An differ from the Lower Yangtse birds in having the back lilac-grey, wing 5·85 in. Those from the latter locality have the back sandy lilac, wing 5·55 in.

10. Urocissa erythrorhyncha (Gm.).

Urocissa sinensis D & O. p. 375, pl. 83.

The Chinese Blue Magpie is common in copses and woods in the hilly parts of north-east Chihli.

A clutch of four eggs brought to me from the hills on the 29th of May, 1917, was fresh, two of four and five eggs respectively received on the 15th of June were nearly fresh, and others received on the 25th of June and three eggs on the 2nd of July were hard-sat, half incubated, or fresh.

These eggs are nearly all very heavily marked; many are globular ovate or about oval, while others are elongated ovate. Green eggs are rather rare, most of the eggs having a clayey-brown ground-colour; but two green eggs obtained on the 25th of June are miniature dark Magpie's eggs.

11. **Garrulus glandarius diaphorus** La Touche.

Garrulus diaphorus La Touche, Bull. B.O.C. vol. xxxv. 1915, p. 98.

The Chihli Jay differs from *Garrulus brandti* of Manchuria in being on average more lightly streaked on the crown, in having the sides of the head unspotted, the lores generally unmarked, and the back often much suffused with vinous. The under parts are more washed with rufous than in the Manchurian Jay, only the innermost secondary is marked with chestnut, and the bill is distinctly smaller. The most striking difference, however, is in the edging of the primaries. This is complete in the Manchurian Jay, but in the Chihli bird the base of the primaries showing beyond the coverts, beginning from the 3rd, 4th, or 5th primary, is black, the innermost primaries being spotted with blue. A black patch is thus formed, just under and beyond the speculum of the secondaries, which is of variable extent, the edging of the flight-feathers being often no more important than in the south China Jay (*G. sinensis*). Two adult females taken in a locality just beyond the Great Wall show very little difference from the ordinary *G. brandti*, the extent of black on the wing being very small and the back quite as pure grey as in that bird. Ten other specimens (nine skins and one live bird) from the mountains some twenty to forty miles north of Chinwangtao, and a skin from the Tung Ling forests, are more or less typical. There is no doubt that, as suggested by Mr. Bannerman in a footnote to my description of this Jay, the bird is a subspecies of *G. glandarius*, and it will doubtless be found to merge completely, in north-east Chihli, with *G. g. brandti*. In the same way it is to be expected that in south-west Chihli or on the borders of the north-west range of *G. sinensis* it will approximate very closely to that species. Thus the Striped-headed Jay of Europe will be connected through these East-Asian Jays with the absolutely plain-crowned *G. bispecularis* of the Himalayas. The Chihli Jay has a strong tendency to a blue speculum on the secondaries, and even in Fohkien the southern bird has occasionally traces of black stripes on the crown. I have no specimens from western China, but I presume that, as I have written above, there will be found a blending of the north and of the south China birds somewhere in west China. Specimens from Hupeh, central China, are typical *G. sinensis.*

The following are the measurements of the twelve examples of the Chihli Jay in my collection:—Bill from nostril to tip of culmen 0·78 in.; wing: ♂ 7·13 in., ♀ 7·19 in.; total length: ♂ (5 ex.) 14·07 in., ♀ (2 ex.) 14·25 in.

The soft parts of a male shot on the 25th of October, 1916, were:—Iris pale silvery mauve; bill black; base of lower mandible bluish; legs greyish flesh. The soft parts of other adult specimens were similar, those of younger birds being somewhat duller.

The Chihli Jay is said to be abundant in the forests of the Tung Ling in north-east Chihli. It is not uncommon in the wooded mountains twenty to forty miles north of Chinwangtao, where it feeds a good deal on acorns, and nests in oak-trees. Two nest-linings, containing each three eggs, with a live bird snared in the latter locality, were brought to me on the 26th of May, 1917. One of the eggs is globular oval in shape, and the others are broadly oval or broad oval-ovate. The ground-colour is a clayey buff. This is freckled all over with pale brown, and a zone on the small end appears in one egg, while the others have this round the large end, or have a cap which is formed of a thick underlying freckling or mottling of reddish grey. Several eggs have the usual soluble dark brown hair-line. The largest egg measures 1·13 × 0·93 in., the smallest 1·08 × 0·93 in., and the six eggs average 1·11 × 0·93 in.

I kept the live bird until the following October, when I gave him to Sikawei. This bird was fed on Kaoliang, raw beef, fruit, insects, etc. Acorns given to it were stored in various parts of the cage for future use.

12. Parus major minor T. & S.

Parus minor D. & O. p. 278.

The Lesser Tit is common in inland wooded localities. Several nests with eggs were brought to me from the mountains in the vicinity on the 16th and 23rd of May (fresh), 15th of June (hard-sat), and 2nd of July (fresh).

13. Parus ater insularis Hellmayr.

Parus ater insularis Hellmayr, Orn. Jahrb. 1902, p. 36.

Parus insularis La T. p. 567.

A number of specimens of this bright-coloured Coal Tit were obtained near Chinwangtao in autumn and winter, 1911. I shot a single example on the 21st of April, 1912, in an old graveyard close to the sea, a few miles off, and that same morning I picked up in a neighbouring field the feathers of another which had been killed. Both were evidently migrants. I did not meet with any other travellers until the 17th of October, 1914, when one appeared on the trees outside my office at the Custom House, and the day after I shot a bird in the small willows behind the Custom House, which was probably that seen the day before. It would thus appear that this Coal Tit travels down the coast, at least occasionally. Mr. Ogilvie-Grant has informed me that the British Museum has examples from North China etc.

The wing in six males varies from 2·28 to 2·40 in., and in four females from 2·15 to 2·30 in.

The Coal Tit found in the west of Chihli is *P. pekinensis*, which occurs in north-west Fohkien and on the borders of Tibet and south-west China.

14. Parus palustris hellmayri Bianchi.

Parus palustris D. & O. p. 288.

Parus palustris hellmayri Bianchi.

The Marsh Tit is common in the interior to within a few miles of the port. It is a resident.

A nest found by me on the 23rd of April, 1913, was placed in a hole of a willow just under the railway embankment and close to a station. It was then being built. On the 4th of May following I returned with the collector Wangwang and found the bird sitting. The nest-hole had a very narrow opening (1½ in. wide) about two feet from the ground. Wangwang lifted the bird off her nest with a bent wire, and after identifying her we released her. There were eight eggs, nearly fresh. They are of a broad and pointed ovate shape, white, with small dots and spots of light red and reddish lilac, largest and most numerous towards the large end, where in most of the eggs they form a fairly well-marked zone. They measure 17 × 12·5 (three eggs), 17 × 12, 16·5 × 13, 16·5 × 12·5 (two eggs), and 16 × 12 mm.*

The Marsh Tit of this district is very similar to that taken at Chinkiang, the only difference being in the extent of black on the throat. This is large and unspotted in Chinkiang examples, while in the northern birds the lower portion is tipped with white. Wing in seven Chinwangtao birds 2·38 in., in six Chinkiang birds 2·31 in.

I found Marsh Tits to be quite common in a wood among the mountains of the Liautung Peninsula, which I visited in February 1890.

15. **Ægithalus caudatus** L.

The White-headed Long-tailed Tit is probably a resident in the wooded parts of this district. The collectors found it a few miles north of the port in November. Several specimens were secured, one of which was identified by Mr. Ogilvie-Grant as similar to European examples. This bird is not mentioned by Père David as occurring in China.

I found this Tit to be common in the mountains of the Liautung Peninsula in February.

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* I am indebted to Messrs. Ogilvie-Grant and Rickett for the measurements and description of these eggs, which were sent to the British Museum in 1913, together with the collection made here that spring for the B. O. C. Migration Committee.

16. **Remiza pendulina consobrina** Swinhoe.

Ægithalus consobrinus D. & O. p. 294.

The Chinese Penduline Tit passes in spring and autumn, but is not common. Two examples were seen and obtained by the collectors—one on the 25th of October, 1911, and another on the 13th of May, 1913. On the 5th of October, 1915, a flock of these birds appeared at the port and remained about the bluff for two or three days. A rather strong south-west wind was blowing during that time. On the weather becoming calm again, the birds disappeared. On the 16th of October, 1916, I again saw a party at the port. This Tit winters on the Yangtse.

I shot several examples of this bird among stacked reeds on the reed-beds near Newchwang during the spring of 1890. Bearded Tits (*Panurus russicus* Brehm) were also found there at the same time, but these were much less numerous.

17. **Suthora webbiana mantschurica** Hartert.

Suthora webbiana mantschurica Hartert, Vög. Pal. Fauna, p. 410.

The Manchurian Crow-Tit is apparently not uncommon in the mountains of north-east Chihli. I have a pair from Shanhaikuan, two examples from the mountains north of the port, and several from Chien An. It differs very markedly from *Suthora webbiana* of the Lower Yangtse and from *Suthora w. suffusa* from north-west Fohkien, being very grey above and rosy on the under parts: ♂, wing 2·08, tail 2·76 in.; ♀, wing 1·95, tail 2·76 in. The bird which is found at Peking appears to be quite different. I have an example, given to me by Mr. Styan, who labelled it *S. longicauda*. This example has sandy-brown flanks and is much less rosy-coloured, while it has a much longer tail than the birds from north-east Chihli. Wing 2·15 in., tail 2·90 in.

I obtained two specimens of the Manchurian Crow-Tit in February 1890 in the mountains of the Liautung Peninsula.

18. **Pterorhinus davidi** Swinhoe.

Pterorhinus davidi D. & O. p. 187, pl. 50.

David's Babbler is a common resident among the mountains north of Chinwangtao. I have a live example, purchased from a native in October 1916, which was reared from the nest and is exceedingly tame. Besides this individual, I had at Chinwangtao three nestlings which I reared myself, and a wild-caught adult. One of the former developed fits and died during the summer, and the latter only lived for a few weeks, dying suddenly towards the end of that season. The two surviving youngsters, however, were thriving when I took them down to Shanghai in the autumn and gave them to a friend. I have never seen the birds wild in their native mountains, but judging from those I have had in captivity, they appear to possess much the same characteristics as the other Hwamei of south China. They are noisy, musical, more or less omnivorous in their diet, combative, and easily tamed. They appear to stand captivity well, and are quite content with the small cages Chinese confine their birds in. The bird purchased by me in the autumn of 1916 is so tame that it will allow itself to be handled without any fear. On being taken notice of, it will puff out its feathers, chattering continuously and elevating its tail above its back, and will eventually sidle up to the hand introduced into its cage; and on being taken up, it will stay there as if hypnotized, making no effort to escape and remaining absolutely quiescent. I have, while the bird was in that condition, cut its claws and bill without its moving. When deposited thus in any place, it will keep in the same position for some time before moving away. This Babbler has a great variety of musical calls, which it will repeat *ad infinitum*, but as a rule without varying the calls. The most usual ones which I have noticed can be syllabled as follows:—"Pi-yo-yo," "dz-re quick-quick," "coo-yew, coo-yew," "tew-whee, tew-whee," "tew chew-chew, chew-chew." During the summer I have heard it sing a low warbling song, which I found it would repeat if I excited it by whistling or waving my hand near the cage. While singing, it swings its head from side to side, puffing out its feathers and holding its tail high up over its back. The song is varied and uttered in consecutive trills with very short intervals between each trill, and while warbled in a very low tone is most harmonious. This bird has been deposited in the Zoological Gardens at Regent's Park.

The young birds reared were very noisy, and continually uttered some of the musical calls of the adult. I fed them on bread and milk, green-bean paste, and chopped raw beef. I fed the adults on the same food with grain of all kinds added. Insects of any kind are also much appreciated. The birds when given grain scatter it at once on the floor of the cage, where they prefer to pick at it rather than take it from the grain-cups.

The soft parts of this bird are:—Iris brown; bill bright yellow, with culmen and point of both mandibles dull yellowish green; legs dark reddish grey.

A number of nests with eggs were brought to me from the mountains during the spring and early summer of 1917 on the following dates:—

11th May, two nests with one and three eggs (fresh).
15th ,, one nest with three eggs (fresh).
16th ,, three nests with two, three, three eggs (fresh).
29th ,, one nest with four eggs (incubated).

The eggs are plain turquoise-blue. The texture is smooth and satiny, with a slight gloss. The shape varies from pure ovate to nearly oval, but the former shape is the most usual. Nineteen eggs average 1·02 × 0·77 in. The largest are 1·08 × 0·75 in. and 1·07 × 0·79 in.; the smallest 0·94 × 0·74 in. and 0·95 × 0·73 in.

The nest, placed in bushes, is a shallow cup made of dried grass blades and grass stems, and is lined with very fine rootlets or grass stems. Five nests average: inner diameter about 3⅓ in., inner depth about 1½ in.

19. **Larvivora cyane** (Pallas).

Larvivora cyane D. & O. p. 238, pl. 27; La T. p. 571.

Pallas's Blue Robin is very abundant on migration.

It passes through this district from about the 10th to the 30th of May and also in the beginning of autumn. My earliest record at that season is the 23rd of August, 1911, and my latest the 28th of September, 1915.

Old females have the rump, upper tail-coverts, and tail dull blue.

This bird was abundant at Newchang in May 1889. It is said to be common about Peking on migration. It is rare at Chinkiang on the Lower Yangtse and is quite unknown in Fohkien. On the other hand, it is common in spring and autumn at Shaweishan at the mouth of the Yangtse. Its migration route is therefore down the Yangtse to the sea, whence it crosses over to Japan and up the coast, and also probably through northern China to its breeding-quarters. It apparently returns by a similar route, avoiding south-east China.

20. **Larvivora sibilans** Swinhoe.

Larvivora sibilans D. & O. p. 239.

I shot an adult male of Swinhoe's Robin at the port on the 19th of May, 1916. The bird was running among some outhouses near a vegetable garden, shivering its tail like Pallas's Blue Robin, the female of which it resembles somewhat when seen from a distance. It can be distinguished, however, by its squamated breast, more rufous upper parts, and red tail. This is, I believe, the first example procured in north China. Its presence was doubtless due to the then prevailing easterly winds. The bird winters in Kwantung Province, passes through north-west Fohkien and the Lower Yangtse, is abundant at Shaweishan, and has been taken in Corea. It summers in Saghalien Island.

21. **Zosterops erythropleura** Swinhoe.

Zosterops erythropleura D. & O. p. 85, pl. 12.

The Red-flanked White-eye appears to pass regularly in autumn through the district. During passage, birds tarry for a short time at the port. I noticed it there on the following dates :—The 26th and 27th of September, 1912 ;

the 29th of September and the 2nd of October, 1914; and the 18th of September, 1915. I have seen this species only once in spring, on the 30th of May, 1916. Contrary to their usual custom, the birds composing the flock seen on this occasion were quite silent.

This White-eye is common at Peking, and I also obtained it at Newchang in August 1889. It is quite unknown on the Lower Yangtse.

22. **Sitta europæa amurensis** Swinhoe.

Sitta amurensis, D. & O. p. 90.

I have a single example of the Amoor Nuthatch, shot in December 1914, in the mountains near Shanhaikuan. Two others had been previously seen by my collector in the same locality. This Nuthatch appears to be very rare in Chihli. The example procured is a male. Culmen 0·58 in., wing 3·10 in.

I found the Amoor Nuthatch to be quite common in a wood in the mountains of the Liautung Peninsula in February 1890.

23. **Sitta canadensis villosa** Verreaux.

Sitta villosa D. & O. p. 91, pl. 13.

The Chinese Grey Nuthatch is not uncommon in the Chien An district, but its appears to be rare in the vicinity of Chinwangtao. I have half-a-dozen examples from Chien An and one obtained near Shanhaikuan in the same wood where my single specimen of *S. amurensis* was taken.

24. **Certhia familiaris** L.

Certhia familiaris D. & O. p. 87.

The Tree-Creeper is not uncommon in certain wooded localities a few miles north of the port. I have also a single example from the Shanhaikuan Mountains. A specimen sent to Mr. Ogilvie-Grant was declared by him to be identical with Norwegian examples. The under parts in the Chihli birds are very white and the upper parts very grey. Père David states that he obtained three examples at the Ming Tombs near Peking.

I found the Tree-Creeper very abundant in the mountains of the Liautung Peninsula in February 1890. It frequented the trees near the villages and farms in the valleys as well as the woods.

25. **Tichodroma muraria** (L.).

Tichodroma muralis D. & O. p. 88.

The Wall-Creeper is found in winter on the cliffs bordering the Shih Ho or Shanhaikuan River. I have four examples, all in winter plumage. One of these, taken in December, has still a spot of black on the throat.

26. **Anorthura fumigata** (T. & S.).

Troglodytes fumigatus D. & O. p. 225.

Anorthura fumigata La T. p. 567.

The Chinese Wren is by no means an uncommon migrant in this vicinity. I have two specimens shot at the port on the 26th of March and 10th of April, 1911, and saw another on the cliffs on the 31st of March, 1913. I have also a number of examples obtained in autumn and winter. The earliest date on which I have seen this Wren in autumn is the 10th of October.

I have a very pale specimen, shot in November, which might be an example of *Olbiorchilus fumigatus idius* Richmond (Eliot Blackwelder, Carnegie Inst. Wash. Publ. No. 54: 'Research in China,' vol. i. pt. ii. pp. 481–508), as the under parts are very white. Other individuals shot at the same season are hardly distinguishable from Lower Yangtse specimens. Some examples shot at Shaweishan on the autumn migration have the breast practically uniform. Others from the same locality bear traces of the barring. Birds from the Yangtse and all those from north-east Chihli have the throat and breast more or less barred.

27. **Regulus cristatus japonensis** Blakiston.

Regulus japonicus D. & O. p. 276; La Touche, Bulletin B. O. C. vol. xxix. p. 139 (1912).

The Japanese Goldcrest is apparently a very common migrant on the China coast in April and in October and November. Several examples were seen or shot on the 27th of October, and on the 4th, 13th, 17th, and 18th of November, 1913, by the Foochow collectors, and I have one from Shanhaikuan, dated the 2nd of February, 1917.

I shot a female of this Goldcrest in the mountains of the Liautung Peninsula in February 1890.

28. **Locustella certhiola** (Pallas).

Locustella certhiola D. & O. p. 248; La T. p. 567.

Pallas's Grasshopper-Warbler is very abundant on passage. It appears from the end of May until the middle of June, but so far I have no evidence of its breeding in north-east Chihli. The autumn passage begins early in the last week of August, and the migrants are about until the end of September. My earliest and latest records at this season are the 22nd and 24th of August and the 28th of September. The birds in spring are all in summer dress with white throat, breast, and abdomen, and unspotted breast (♂). In autumn, nearly all those shot are in winter or in the young plumage (rich buff under parts). In this Grasshopper-Warbler the feathers of the crown are edged with grey, in *strong* contrast with those of the back, which are olive-brown centred on the mantle with black. I have one example, shot at Foochow on the 6th of June, which has the crown-feathers coloured like those of the rest of the upper parts, the whole upper colouring appearing very pale. Thinking the bird was new, I sent it to the British Museum, where Mr. Ogilvie-Grant determined it as merely *L. certhiola*. A similar specimen would seem to have been obtained in Manchuria by Mr. C. Ingram's collectors.

29. **Locustella lanceolata** (Temm.).

Locustella lanceolata D. & O. p. 251; La T. p. 568.

The Streaked Grasshopper-Warbler is very abundant in spring from about the middle of May to the beginning of June, and in autumn from the last ten days in August until well on into October, the latest records I have for that month being the 8th and 10th. There is great variation in the breast-markings. It probably sometimes stays a little later, as I saw on the 23rd of October, 1915, the remains of a bird which had been killed by a cat.

30. **Acrocephalus arundinaceus orientalis** (T. & S.).

Calamodyta orientalis D. & O. p. 252.

Acrocephalus orientalis La T. p. 568.

The Eastern Great Reed-Warbler is not a common migrant at Chinwangtao, where I have only seen a few towards the middle of May, on the 1st and 4th of June, and in autumn during August and September. It appears, however, to breed abundantly in the Hsieh Chia Ying marshes, where nests and eggs were brought to me at the end of June and beginning of July. These resemble those taken at Chinkiang (Ibis, 1906, p. 444).

The nests are made of weeds, grasses, and grass-down.

This Reed-Warbler was extremely common in the reed-beds near Newchwang during the summer of 1889.

31. **Acrocephalus agricola concinnens** Swinhoe.

Calamoherpe concinnens D. & O. p. 251.

The Paddy-field Reed-Warbler is evidently a rare migrant at Chinwangtao, as in seven years' collecting I obtained but one example, shot near Shanhaikuan on the 10th of June, 1914. Swinhoe found it breeding near Peking (*Calamoherpe concinnens,* P. Z. S. 1870, p. 432) in numbers. Père David states that it breeds everywhere in damp spots on the Great China Plain, so that it seems likely that it will eventually be found to breed in the north-east Chihli marshes.

The measurements of the skin mentioned above are as follows:—Culmen 11 mm.; wing 57 mm.; tail 60 mm.; tarsus 22 mm. Total length about 130 mm.

32. **Acrocephalus bistrigiceps** (Swinhoe).

Calamodyta maackii D. & O. p. 254.

Acrocephalus bistrigiceps La T. p. 568.

Von Schrenck's Reed-Warbler is by far the commonest of the Reed-Warblers found in the vicinity. It appears in spring towards the 15th of May, and some remain until the middle of June. It is extremely abundant in the millet crops on the plain during August, and when the crops are cut, spreads to the grass-covered marshes, where it is abundant in October. The earliest date on which I have seen this bird on the autumn migration is the 7th of August, 1912, and the latest the 26th of October, 1914, and the 27th of October, 1912. At the end of August many young birds, probably bred in the vicinity, are about. They appear to moult before they leave for the south. The young bird is paler above than the adult, especially on the crown; the black eyebrow is less marked, the feathers being edged with fulvous brown; the wing-feathers are edged with paler brown, in strong contrast with their dark centres. I have occasionally heard birds singing at the port on the spring migration. The song is not loud but very melodious. This Warbler and the Black-naped Oriole are the only migrants heard singing at Chinwangtao.

33. Acrocephalus tangorum La Touche.

Acrocephalus tangorum La Touche, Bull. B. O. C. vol. xxxi. 1912, p. 10; Ibis, 1914, p. 568.

Description (autumn bird). Upper parts warm fulvous brown, more fulvous in young birds. A pale buff superciliary stripe, and above this a narrow and more or less blackish stripe. Throat and centre of abdomen silky white. Rest of under parts warm rufous buff. Wings and tail brown, edged exteriorly with the same fulvous brown as the back. Tail-feathers narrow and pointed. A male shot on the 5th of June has the upper parts less fulvous than autumn birds and its superciliary stripe is whitish, the dark band above it being more conspicuous than in the autumn birds. The soft parts of this bird were as follows:—Iris greyish hazel; upper mandible blackish; lower mandible flesh-colour; tongue bright yellow; rictus and mouth yellow; legs yellowish flesh-colour. One of the birds obtained in 1912 has the legs described on the label as plumbeous. Seventeen males and four females measure as follows :—

Culmen...	10·5–12	mm. ;	average,	a little over 11 mm.
Wing......	51–55·5	,,	,,	53 mm.
Tail	50–54·5	,,	,,	52 ,,
Tarsus ...	22	,,		

The 1st primary is minute as in *A. agricola*; the 2nd primary is equal to the 6th, or is intermediate between the 6th and 7th ; the 3rd and 4th primaries are equal and longest.

This Reed-Warbler might at first glance be mistaken for *A. bistrigiceps,* but on closer examination it will be found to differ from that species in its wing formula, minute first primary, brighter colouring, large bill, and long and narrow rectrices. It is closely allied to *A. agricola*, from which it differs in its wing formula, brighter colouring, and dark stripe above the eye.

The North China Reed-Warbler is very common in the small millet-fields (*Panicum italicum, P. miliaceum,* and *P. crus-galli*) in the plains round Chinwangtao from about the 18th of August to early in the latter half of September. In spring I have only met with it on a few occasions, each time among willow-scrub and long grass at the port itself (on the 30th of May and the 2nd of June, 1913, when a pair was seen and secured on each of these dates; at the end of May and on the 5th of June, 1915, when several specimens were seen ; and in 1917 from the 21st of May to the beginning of June). It is probable that this Reed-Warbler breeds in the marshes of the district. In autumn it abounds in the millet crops, which it works in parties, generally in company with *A. sorghophilus* and *A. bistrigiceps*, flitting through the cover and occasionally sidling up to the millet tops, where the birds sit, preening their feathers for a short time before commencing their search after food. It does not appear to frequent paddy-, sorghum- or maize-fields, but I once, on the 16th of September, shot one out of a party in a patch of reeds in a marsh. I have never heard the bird utter a sound. It seems to moult towards the end of August.

34. **Acrocephalus sorghophilus** (Swinhoe).

Calamodyta sorghophila Swinhoe, P. Z. S. 1863, p. 292.

Calamodus sorghophilus D. & O. p. 246.

Acrocephalus sorghophilus La Touche, Bulletin B. O. C. vol. xxix. 1912, p. 141; La T. p. 568.

The first example of the Chinese Sedge-Warbler was shot by Swinhoe at Amoy (S.E. Fohkien) in May 1861. No other appears to have been taken until January 1902, when one was shot in the Babuyan group of the Philippine Is. (Bulletin Philippines Museum, No. 4, 1904, p. 29). After a further interval of nine years one specimen was taken at Shaweishan, thirty miles from the mouth of the Yangtse, on the 2nd of June, 1911. Five days after, I shot another at Chinwangtao, and at the end of that summer, on the 22nd and 29th of August, 1911, I shot two more in the crops near the port. In August and September 1912, I again secured examples in the millet crops, where I found this Reed-Warbler to be common. In the following spring (1913) a large number passed the port on migration at the end of May and beginning of June, and that year and the following the bird was common, as before, in the millet crops at the end of the summer. The spring passage thus appears to take place late in May and during the first week in June, and the autumn passage from about the 22nd of August to the 7th of September. The breeding-grounds will probably be found in south Manchuria and possibly within the limits of north-east Chihli. As it has never been taken on the Yangtse or in the Indo-Chinese countries, we must presume that the line of migration followed by this bird is from the Philippine Is. *via* Formosa to Fohkien, and thence up the China coast to north-east Chihli. We have no record of the autumn migration from elsewhere than Chinwangtao, but the presumption is that the course followed is the same as in the spring.

The bright-coloured upper parts of this Sedge-Warbler causes it to be easily distinguished in the open from the more soberly tinted *A. bistrigiceps*, and its gliding flight with outspread tail from *A. tangorum*. Spring birds are as a rule rather heavily and regularly streaked on the crown and mantle and have the black superciliary stripe very apparent; they are less fulvous above than autumn birds. The latter are of a warm ochreous light brown above, with very few streaks and a less apparent black eyebrow. Two August specimens, probably birds of the year, have this black eyebrow almost entirely concealed by the fulvous edging of the feathers.

Iris hazel or greyish hazel; upper mandible dark brown, edged with fleshy yellow; lower mandible fleshy yellow; mouth yellow; legs greenish plumbeous; soles of feet greenish yellow. Total length of a male shot on the 7th of June, 1911, 5·30 in. (135 mm.).

35. **Arundinax aëdon** (Pallas).

Arundinax aëdon D. & O. p. 254; La T. p. 568.

Pallas's Reed-Warbler is, next to *A. bistrigiceps*, the most conspicuous of the Reed-Warblers seen at the port during migration. It appears in spring from the middle of May to the beginning of June, and in autumn from about the 17th of August to the end of September. One was shot in 1911 on the 16th of October, but it was probably a belated instance. This bird is generally very shy, and consequently it is not always easy to identify, its strong resemblance to *A. orientalis* making it often difficult to ascertain which of these species is so sedulously endeavouring to elude observation. It is most probably a summer visitant, as I once saw it singing on a willow in a likely nesting locality on the 2nd of June. It breeds near Peking on reed-covered ponds (*David*).

This Warbler was common in May and late August 1889 about Newchwang.

36. **Tribura thoracica** (Blyth).

Dumeticola affinis D. & O. p. 247 (part).

In 'Les Oiseaux de la Chine' Père David mentions under "*Dumeticola affinis*," birds obtained near Peking in summer which differed slightly from those found in the

Himalayas, though he did not otherwise distinguish them. Our house-cat caught on the 4th of September, 1912, a young bird of this species, and I shot two adults from brushwood on the 31st of May and the 1st of June, 1917. These, together with a wing (remains of a bird eaten by a cat) found on a doorstep on the 1st of October, 1914, are the only specimens obtained by me at Chingwangtào during a stay of seven years.

The soft parts etc. of these adult birds were :—Iris rather pale brown ; bill black ; mouth pink ; legs dark pink or flesh-colour.

Two males :—Wing 2·03 and 2·06 in. ; total length 5·05 and 5·25 in. ; 1st primary 0·51 in. ; 2nd primary equal to the 7th ; the 3rd and 4th equal ; the 5th almost equal to them, but just below.

The young bird, a male, is rather paler above ; lores and an indistinct short eyebrow yellowish ; under parts dull pale primrose-yellow, the feathers of the breast edged with olive-brown and faintly spotted ; throat and vent whitish yellow ; under tail-coverts (very long and covering outer rectrices) pale olive-brown, broadly tipped with dull yellowish.

Iris grey-brown ; upper mandible of bill blackish, edged with pink ; lower mandible flesh-colour, shading to yellow at the base and with a dark point ; rictus yellow ; legs flesh-colour, with a tinge of brown on the feet ; soles of feet and hind part of tarsus light yellowish green.

Bill from gape 0·60, culmen 0·45, wing 2·05 in. ; the 1st primary 0·55 in. The 2nd primary is equal to the 7th ; 3rd, 4th, and 5th longest and equal. Tail (worn) 1·85 in. ; the outer rectrix about 0·50 in. shorter than the central. Tarsus 0·70 in. The specimen has a deformed foot, turned backwards. It appears to be a young bird of the year.

37. **Herbivocula schwarzi** (Radde).
Herbivocula flemingi D. & O. p. 245.
Herbivocula incerta D. & O. p. 246.
Herbivocula schwarzi La T. p. 568.

Radde's Bush-Warbler is a common migrant in this district. It passes from the middle of May to the first days of June, and from about the 20th of September until the middle of October. Most of the autumn birds are in fresh-moulted pale plumage (*H. incerta* D. & O.), as are also most of those taken or noticed in spring. Examples in olive and bright buff-yellow plumage are to be seen in autumn but less commonly. This Bush-Warbler is a very shy bird, and if it is at all suspicious of danger, keeps itself well concealed in bushes and high grasses, constantly uttering a nervous "twit-twit." In 1912, from the 19th of September to the end of the month, it was very abundant and swarmed all over the island.

Total length of a male with pale under parts 5·65, wing 2·6, culmen 3·5, bill from gape 5·5, tarsus 0·88, tail 2·25 in. Females are much smaller.

The soft parts of this bird were as follows:—Iris dark brown; upper mandible very dark livid green; lower mandible deep greenish yellow, green towards the tip; gape and mouth yellow; legs warm gamboge; front of tarsus brownish.

38. **Herbivocula fuscata** (Blyth).
Phyllopneuste fuscata D. & O. p. 267.
Herbivocula fuscata La T. p. 568.

The Brown Bush-Warbler is a very common migrant. It passes from about the 20th of April to the end of May, and from the beginning of September to the latter half or end of October. I have one shot at Shanhaikuan as late as the 18th of November.

This bird shows considerable variation in the tints of the lower plumage and in its proportions. It is a bush-frequenting species, fond of damp places, and it seeks its insect-food on the ground or close to it.

39. **Phylloscopus borealis** (Blasius).
Phyllopneuste borealis D. & O. p. 271.
Phylloscopus borealis La T. p. 569.

The Arctic Willow-Warbler is common from the middle of May to well on in June, and from about the 10th of

August to the middle of September. While on passage at the port it is often seen flitting about the grass or low bushes as well as on trees.

40. **Phylloscopus nitidus plumbeitarsus** Swinhoe.
Phyllopneuste plumbeitarsus D. & O. p. 270.
Phylloscopus plumbeitarsus La T. p. 568.

The Plumbeous-legged Willow-Warbler is abundant on passage in spring and autumn. It generally travels with *P. borealis*, but remains much later in autumn. I have observed it from the middle of May to the first week in June, and from the latter half of August to about the 22nd of September. It must remain later, for in 1911 the collectors shot one on the 4th of October. At the beginning of September 1913 and 1914 this bird swarmed for a few days on some jujube-bushes behind our house, which were infested with leaf-devouring insects. When disturbed it utters a loud cry somewhat like that of *P. borealis,* but louder and more drawn out. The legs are always more or less suffused with plumbeous, but I have handled only one which has the tarsus of a uniform pure plumbeous.

41. **Phylloscopus tenellipes** Swinhoe.
Phyllopneuste tenellipes D. & O. p. 269.

The Pale-legged Willow-Warbler is not common at Chinwangtao. I procured only two specimens—one on the 29th of September, 1912, and one on the 7th of September, 1914. The call is a loud " tsic," somewhat resembling that of the preceding two species.

42. **Phylloscopus coronatus** (T. & S.).
Phyllopneuste coronata D. & O. p. 269.
Phylloscopus coronatus La T. p. 569.

Temminck's Crowned Willow-Warbler seems to be a scarce migrant. I have never seen it at the port. Three examples were observed a few miles inland by the collectors on the 16th of May, 1913, two of which were shot.

This Willow-Warbler was common at Newchwang in May and at the end of August 1889.

43. **Phylloscopus superciliosus** (Gm.).

Reguloides superciliosus D. & O. p. 273.

Phylloscopus superciliosus La T. p. 569.

The Yellow-browed Willow-Warbler is abundant on migration. I have observed it from the 11th of April to the 25th of May. It appears at the end of August with the other Willow-Warblers, but the majority arrive in September, and migration lasts until the end of October. The earliest date on which I have seen it on the autumn passage was the 19th of August, 1913, and the latest date was the 30th of October, 1914. This Willow-Warbler was common at Newchwang in May and at the end of August 1889.

44. **Phylloscopus proregulus** (Pallas).

Reguloides proregulus D. & O. p. 274.

Phylloscopus proregulus La T. p. 569.

Pallas's Willow-Warbler is a common migrant in the district. It occurs from the first week in April to early in the latter half of May, and from about the 22nd of September to the end of October. Rushes of this little bird occur in early spring and in October, when they may be seen swarming everywhere and even occasionally penetrate into houses.

I saw this species near Newchwang on the 20th of May, 1889.

45. **Lusciniola pryeri sinensis** Witherby.

Lusciniola pryeri sinensis Witherby, Bulletin B. O. C. vol. xxxi. 1912, p. 11.

Lusciniola sinensis La T. p. 569.

Description. "Adult male and female. Summer plumage. Differ from *L. p. pryeri* (Seebohm) in the much less rufous colouring of the upper parts, the whiter colour of the breast and belly, and in having a rather longer tail. General colour of the upper parts bright brownish buff striped with black, the feathers being black broadly margined with bright brownish buff, the black markings being more restricted on the upper tail-coverts; forehead with only narrow streaks of black; lores and over the eye whitish; ear-coverts and side of neck brownish; throat, breast, and belly white, the sides flanks, thighs, and under tail-coverts bright buff. Under wing-coverts and axillaries greyish white; wing-feathers brownish black, with broad buff edgings to the outer webs; the four innermost secondaries with the outer webs deep black margined with bright buff. Tail buffish brown with black shaft-stripes, narrow on the outer feathers and becoming much broader on the middle feathers" (*Witherby*).

"Iris dark umber; legs and feet pallid flesh-colour" (*H. Lynes*). The soft parts of two specimens shot at Chinwangtao were as follows:—

♂. 14th of April, 1911.—Iris light brown; upper mandible black, rimmed with pink; lower mandible pink; legs yellowish pink. Wing 2·38 in.

♂. 14th of April, 1911.—As in above, but legs tinged with plumbeous. Wing 2·22 in.

Wings of nine examples shot in autumn measure from 1·90 to 2·25 in., average 2·10 in.

The proportions of Captain Lynes's Hankow specimens given by Mr. Witherby are as follows:—

♂. Bill (from nostril) 6½ mm.; wing 59, 57, and 56; tail 62 and 61 (worn), 46 (much worn).

♀. Bill (from nostril) 6½ mm.; wing 54, 53, and 51; tail 54, 54 (worn), 47 (much worn).

The Chinese Marsh-Warbler was first seen by me on the 14th of April, 1911, when I shot one at the marshes near the port. Two days after I saw a couple more at the same place and shot one of them. These birds were found in the grass on the edge of the marsh. When pursued they flew into it and hid in the grass in the ponds. A third example was shot by the collectors on the 19th of October, 1911, and a fourth at the port itself on the 24th of April, 1913. In the meantime the bird had been discovered by Captain H. Lynes, R.N., in March 1912 at Hankow, where it winters in the neighbouring swamps. I did not come across this Warbler again until the 18th of October, 1914, on which date, while duck-shooting in the marshes, I found the birds swarming on the grassy banks and among the sedgy grass of the locality. On this occasion the birds behaved like Grasshopper-Warblers, and when on the wing looked like pale-coloured *Locustellæ.* A high wind was blowing, and probably on this account they took but very short flights and dropped into the grass a few paces ahead, rising again when I was close upon them. After being put up once or twice they flew with a swift, low, and straight flight into the jheels, where they hid in the sedges. I managed to secure two or three, and having run short of collecting cartridges, I was returning home, when I met a party of men out hawking with Sparrow-Hawks. These men had taken several of the Warblers, and on my offering a small reward they proceeded to catch me some. Several of the birds thus caught were sufficiently uninjured to be made into fair skins. On the way across the plain I put up one out of the crops. The breeding-quarters of this Warbler have yet to be discovered. Probably Manchuria is the locality.

46. **Rhopophilus pekinensis** (Swinhoe).
Rhopophilus pekinensis D. & O. p. 260, pl. 19.

The North China Hill-Warbler is very common in the mountains of north-east Chihli. I met with it among scrub oak about twenty miles north of Chinwangtao, and have specimens shot much nearer the port as well as a series from the Chien An district. A single bird appeared at the port in October 1915, and remained there during about two months. In the spring of 1917, after the pruning of the acacia plantations, one individual was again conspicuous, but unfortunately it was trapped by a Chinese and soon died. The body was brought to me. It was a female, much soiled with coal smoke, and was probably the bird seen eighteen months before. A cage-bird of this species offered to me for sale was so tame that its owner would let it out in the open, the bird returning obediently when called. I had a live bird, trapped in May 1917, which soon became very tame. This bird, which I had put in a cage containing Buntings, Finches, etc., when it saw me coming into the room would cling to the wires in expectation of the coming food, and on my opening the cage would fly on to my hand and take food while perched on it. It spent a great deal of its time perched close against some of the other birds, holding out its head and neck to have its feathers preened by them. Some of the birds, however, with an eye to nesting, took advantage of this to pluck its feathers, so that I had to take it out, and when it found itself alone, it became shy and remained so.

I fed this bird on green-bean paste, chopped raw beef, and bread and milk, also on hard-boiled egg. It was fond of caterpillars and ate certain kinds of small green grasshoppers, but would not touch the brown grasshoppers that other birds prefer to the green ones. It was sent to London in June 1919, but unfortunately did not reach the Zoological Gardens. In the summer of 1918, while at Shasi (Hupeh, Central China), it moulted badly, being unable to grow its tail, which appeared as a bunch of flexible plumes, the shafts of the retrices being only furnished with vanes at intervals in the shape of rounded spatules—about three of these to a rectrix. I then suspected that there was something wrong with the sand furnished—this was very fine river sand. I substituted coarser hill-stream sand, which caused an almost immediate change. The bird's tail-feathers began to grow strong and normal, keeping at their tip the curious plumes mentioned above, which were gradually shed as the rectrices grew. The tail eventually became normal and of full length. Some nestlings brought to me died the same day of their arrival from the hills.

The bird nests in May. Nests with eggs were brought to me on the 11th, 16th, 23rd, and 29th of May, 1917. The eggs in the last nest brought were incubated, but those in all the others were either quite fresh or slightly incubated. The full clutch consists of five eggs. These are greenish white, speckled, spotted, or even blotched with umber-brown and dark and pale violet, the latter tint being that of markings within the shell. The markings are chiefly on the large end, generally forming a wreath. They are quite without gloss. The shape is ovate, occasionally oval or oval-ovate.

They vary in size from 0·75 × 0·55 in. to 0·83 × 0·61 in. Thirty-four eggs average 0·77 × 0·57 in.

The nest is a well-made, neat, and deep cup of soft dry grasses, thickly and strongly bound with strips of grass-skins, and much plastered over exteriorly with hair, cobwebs, and cocoons. It is not unlike that of *Suthora webbiana*. The natives who brought me the nests told me they were placed in bushes. The inside measurements in nine cases are: depth 2 to 2½ in., average 2·20 in.; diameter 2 to 2½ in., average 2·20 in. The outer measurements are: depth 2¼ to 3 in., average 2¾ in.; diameter 3½ to 4 in., average 3·64 in.

47. **Dicrurus ater cathœcus** Swinhoe.

Dicrurus cathœcus D. & O. p. 108.

Buchanga atra La T. p. 567.

The Black Drongo is an uncommon migrant in spring. I have very few records of its occurrence at that season, and but one or two birds might be seen at any time between the 20th of May and the 11th of June. It is extremely abundant in September, passing with the myriads of Swallows, Pipits, and Wagtails, which during that month stream down the coast. While travelling it often tarries on the plains, perching on the kaoliang and catching insects on the wing. Sometimes it forms huge noisy parties on some solitary tree in the fields. The calls while thus resting and feeding are cheerful and musical. The birds when passing fly in very scattered order, and appear to come from an easterly or north-easterly direction. I have noticed this Drongo migrating from the first week in September to the end of that month. I have seen one on the 24th of August.

Four nests, containing respectively four hard-sat, two incubated, three fresh eggs, and one broken egg, were brought to me on the 25th of June from the mountains north of the port, and two more nests from the same locality on the 15th of July containing two and three fresh eggs. These are of two types: white, sparsely speckled with very dark brown, and warm orange-salmon or orange-buff, blotched chiefly at the large end with burnt sienna over underlying violet markings. Fourteen eggs measure from 0·99 × 0·67 in. to 1·05 × 0·75 in., and 1·04 × 0·77 in. They average 1·01 × 0·74 in.

The nests were strong shallow cups or fairly deep saucers, composed chiefly of kaoliang-seed flower tops and similar grass tops and rootlets, bound with cobwebs and cocoon silk. Five nests measured had an inner depth of 1¾ in. (three nests) and 1½ in. (two nests), with an inner diameter of 3½ in. The outer depth varied from 2 to 2¾ in. and the outer diameter from 4¾ × 6 in. to 6 in. The nests had apparently been taken from forks of horizontal branches.

48. **Lanius sphenocercus** (Cabanis).

Lanius sphenocercus D. & O. p. 92, pl. 76; La T. p. 569.

The Chinese Grey Shrike is found sparingly in spring, but much more commonly on the return passage, when it may be seen from the beginning of September, throughout October, and in November. A number winter in the district. This Shrike may be seen hovering like a Kestrel. Generally it takes up a position on some high bush or tree in the open plain, and is always a very conspicuous object. Birds obtained in early September had newly moulted, and all autumn birds have their plumage of a very pure white and grey. During the winter the plumage becomes dingy, and specimens shot in spring have their feathers dirty and worn. A large Grey Shrike seen near Newchwang on the 6th of September, 1889, was probably of this species. Another was seen by a friend during the following winter.

49. **Lanius mollis** Eversmann.

A medium-sized Grey Shrike with a rounded tail and under parts waved with brownish grey, each feather being bordered with this colour, was shot at the hills north-west of the port on the 12th of October, 1911. According to Dr. Hartert (Nov. Zool. vol. xiii. 1906, p. 393), this bird should stand as

Lanius mollis Eversmann. I shot another of these Siberian Grey Shrikes at the port itself on the 25th of October, 1914. This specimen, however, is slightly the larger and has greyish-white upper tail-coverts. It is probably a younger bird, as it is tinged above with buff and the ear-coverts are brownish grey.

These two birds measure :—

♂. 12th of October, 1911. Wing 4·55 in., tail 4·35 in.
♀. 25th ,, 1914. ,, 4·55 in., ,, 4·53 in.

50. **Lanius bucephalus** T. & S.

Lanius bucephalus D. & O. p. 98 ; La T. p. 569.

The Bull-headed Shrike is evidently a rare migrant at Chinwangtao. I have an adult male shot at Shanhaikuan in April 1913. My collector, who procured me the bird, told me that these Shrikes had been passing Shanhaikuan that month. I saw an adult male at Chinwangtao on the 31st of March, 1914, and again the following day in the same place one which was probably the bird seen the day before.

51. **Lanius tigrinus** Drapiez.

Lanius magnirostris D. & O. p. 97.

The Thick-billed Shrike was not seen by me at Chinwangtao, neither did the collectors, who worked the vicinity assiduously during the spring of 1913, come across any ; but my collector shot two adult males at Shanhaikuan on the 26th of May, 1914. He seemed to consider this Shrike a very rare bird.

I was brought two nests on the 2nd of July, 1917, which I suspect must belong to this bird. They were taken in the mountains, north of the port, and were found placed high up in trees. The taker of these nests positively assured me that the owners were Shrikes, but that he could not snare the birds, owing to the position and height of the nests. One of these is a strong, compact cup, with thick sides made of rootlets and fine grasses, a few flower- and grass-tops, with moss at the base and some animal fur worked into the inner rim of the nest. The lining is of very fine grass stems. This nest measured 2 in. in inner height and 2½ × 3 in. in inner diameter. The outer measurements were: depth 2½ in. and diameter 4½ in. The eggs have a pale orange-yellow ground, and are thinly speckled with blackish brown over dark grey underlying spots and specks. They measure 0·80 × 0·64 in., 0·83 × 0·64 in., 0·83 × 0·65 in., and 0·92 × 0·67 in.

This Shrike summers at Newchwang, South Manchuria.

52. **Lanius lucionensis** L.

Lanius lucionensis D. & O. p. 99; La. T. p. 569.

I have but few records of the Philippine Red-tailed Shrike from Chinwangtao itself, as it is difficult to distinguish it in the field from the following species, but I have noted it both in spring and autumn and have a specimen from Chien An. It nests abundantly in the mountains north of Chinwangtao, whence some twenty-six nests were brought to me (ten clutches received on the 25th of June, 1917, ten on the 2nd of July following, and six others on the 15th of the latter month). Nine of those brought on the 25th of June were fresh, the others were all incubated or hard-sat. The nests, large stout cups composed of downy grass tops, feathers, twigs, grass stems, and in two cases to a great extent of pheasants' feathers, were said to have been all placed in trees at some distance from the ground. Ten nests measured were about 2 in. deep by 3 in. in diameter (inside measurements), and from 2¼ in. to 3¾ in. in outer depth by about 5½ in. in outer diameter. The eggs show great variety in size, tints, and intensity of markings.

53. **Lanius superciliosus** Latham.

Lanius superciliosus D. & O. p. 100; La T. p. 569.

The Japanese Red-tailed Shrike is very common on migration in spring and early autumn. It appears about the middle of May (earliest record 11th May), and may be seen until the beginning of June. The autumn passage takes place from about the 20th of August to the end of September. It is most plentiful at the end of August and beginning of September. Being a shy bird, it is, as a rule, very difficult to decide whether individuals, especially in autumn, belong to this species or to *L. lucionensis*. Possibly some of the Red-tailed Shrikes seen or obtained were *L. cristatus*.

54. **Pericrocotus cinereus** Lafresnaye.

Pericrocotus cinereus D. & O. p. 107 ; La T. p. 569.

A few Ashy Minivets pass through the district from about the middle of May to the beginning of June. I saw a couple on some trees near the seashore on the 29th of September, 1912. I have an example from Chien An.

55. **Oriolus indicus** Jerdon.

Oriolus cochinchinensis D. & O. p. 133.

Oriolus diffusus Sharpe, D. & O. p. 559.

Oriolus indicus La T. 1914, p. 570.

The Black-naped Oriole summers in the district, as elsewhere in China. I have occasionally seen arrivals at the port itself, and on the 5th of June, 1915, some birds appeared on the trees there, when, probably for the first time, the beautiful liquid notes of the bird were heard at Chinwangtao. The middle of May is about the earliest date of spring arrivals, and the birds must leave in September, as they occasionally appear at the port during that month. A nest taken at Shanhaikuan on the 10th of July, 1915, contained three fresh eggs. Two of these, brought to me by my collector, are of the usual blush-pink colour, with deep carmine spots chiefly disposed about the large end. They are moderately glossy. The shape is narrowly ovate. They measure 1·18 × 0·81 in. and 1·26 × 0·82 in.

Five other nests with eggs were brought to me from the mountains to the north of the port on the 10th of June, 1917. One clutch was fresh, the others incubated and stale.

56. **Spodiopsar cineraceus** (Temm.).

Sturnus cineraceus D. & O. p. 361.

Spodiopsar cineraceus La T. p. 570.

The Grey Starling passes in spring from the end of March to about the 20th of May. It appears again in July, and may be seen in autumn until the beginning of October. On the 4th of July, 1914, thousands came over from the north-east, flying south-west. Flocks containing from fifty to over three hundred individuals followed one another rapidly during the afternoon, and the passage lasted two hours or more. This was the only passage of the kind noticed by me here. On every other occasion that I saw these birds in summer they were in very small parties. However, on the 24th of July, 1915, I saw a large flock of Starlings passing which were probably of this species, so that it is likely that the main flights during other summers were overlooked. At Shaweishan, in 1908, a few individuals were noticed at the end of June and beginning of July. I do not know whether they breed here, but, as I saw on the 21st of May two birds apparently paired, it is probable that some summer here.

Two examples netted in the summer of 1913 are pale buffish sandy, except on the abdomen, under tail-coverts, axillaries, and under wing-coverts, cheeks, and ear-coverts, these parts being white, as are also the outer webs of the basal part of the middle secondaries and primaries. The wings and tail are darker than the body. My collector, who brought me these birds, told me that this pale variety was not uncommon.

57. **Sturnia sturnina** (Pallas).

Temenuchus dauricus D. & O. p. 362.

Sturnia sturnina La T. p. 570.

The Daurian Starlet passes in small numbers during the latter half of May. Large flocks may be seen in August on the return migration. I have seen a few at Chinwangtao itself from the 6th of August to the 2nd of September.

A live male example purchased in June, 1916, kept in good health until the autumn, when it sickened and died. It was a cheerful little bird and sang often, the song being occasionally harsh, but containing many melodious notes. It was very cleanly and was very fond of bathing, keeping its plumage so free from dirt that, when it died, it was difficult to tell from the made-up skin that it was a cage-bird. This bird's favourite food seemed to be bread and milk. It also ate millet and raw beef, but did not care for fruit or grasshoppers. However, when plants covered with aphides were placed in the cage, it picked these off with evident pleasure.

I shot specimens of this Starlet near Newchwang in May 1889.

58. **Alseonax latirostris** (Raffles).
Butalis latirostris D. & O. p. 123.
Alseonax latirostris La T. p. 570.

The Broad-billed Flycatcher is common on migration. It passes from early in May to the end of the month, and I have seen it on the return passage from early in August to about the 8th of September. I once shot one which was standing on the mud on the bank of a ditch, and on another occasion I saw one fly down to a garden-path from its perch on neighbouring trees, and hop along the ground picking up food.

59. **Hemichelidon sibirica** (Gm.).
Butalis sibirica D. & O. p. 122.
Hemichelidon sibirica La T. p. 570.

The Siberian Flycatcher is common on migration. It passes from the middle of May to late in June and during August and the early part of September.

I shot a young bird in spotted plumage at Newchwang in August 1889.

60. **Siphia parva albicilla** (Pallas).
Erythrosterna albicilla D. & O. p. 120, pl. 79.
Siphia albicilla La T. p. 570.

The Red-throated Flycatcher is about the commonest of the Flycatchers which pass Chinwangtao. It occurs from early in May to the beginning of June, and I have seen it from the 29th of August to the middle of October. One specimen was seen on the 29th of October. In spring most of the males have the red throat and grey breast. On the return passage they are all in winter dress. This Flycatcher has very terrestrial and Robin-like habits. It is fond of flitting along hedges and trees bordering roads. It often descends to the ground in the open fields, perching on clods of earth, and finds much of its food on the ground. It has the habit of jerking up and flirting its tail like the Robins. When on the wing, its black-and-white tail makes it a very conspicuous object.

I shot a specimen of this bird near Newchwang at the end of May 1889.

61. **Poliomyias luteola** (Pallas).

Erythrosterna luteola D. & O. p. 121.

Poliomyias luteola La T. p. 570.

The Robin Flycatcher is a scarce migrant in the vicinity. Three examples were seen on the 20th of May, 1913, and one on the 23rd of that month by the collectors. A passage of this Flycatcher occurred at Chinwangtao on the 16th of May, 1916, when it was numerous. I have no autumn records.

62. **Cyanoptila bella** (Hay).

Cyanoptila cyanomelæna D. & O. p. 116, pl. 81.

So far I have not collected the Blue and White Flycatcher in north-east Chihli. It is, however, well-known, and it is much valued as a cage-bird by the natives on account of its song.

I saw specimens in captivity at Newchwang in 1889.

63. **Xanthopygia tricolor** Blyth.

Xanthopygia tricolor D. & O. p. 118, pl. 80; La T. p. 570.

The Tricolor Flycatcher passes in small numbers in spring. I saw one at the port on the 11th of May, 1911, another on the 16th of May, 1916, while the collectors shot or observed examples on the 13th, 16th, and 20th of May, 1913. I have a specimen shot at Shanhaikuan on the 7th of May, 1914. I have not seen the bird on the return passage.

The Tricolor Flycatcher is a common migrant at Newchwang in May. It is easily trapped by the natives, but does not stand captivity well.

64. **Terpsiphone incii** (Gould).

Tchitrea incii D. & O. p. 112, pl. 82.

Terpsiphone incii La T. p. 570.

Ince's Paradise Flycatcher arrives at Chinwangtao about the 20th of May and the passage lasts until well on in June. It appears again during the last week in August and occurs until the 23rd or 24th of September. I have an example from Chien An. This bird breeds in the mountains north of the port, whence I have a white-plumaged male and had a clutch of four eggs, almost hatching, brought to me on the 2nd of July, 1917. I shot a white-plumaged male, the only one seen at Chinwangtao, on the 7th of June, 1913. The white feathers of this bird are all broadly edged with black, and one of the innermost secondaries has a trace of chestnut. The tail measures only 9·5 in.

The flight of this Flycatcher in the open is swift, and the tail streaming behind it reminds me of an arrow shot from a bow. It is difficult to understand how such an apparently unwieldy appendage does not prevent its owner from travelling, but it is a fact that the Japanese Paradise Flycatcher is found in spring at Shaweishan with fully-grown rectrices, and that to reach Japan from that island it has to cross over 450 miles of open sea. The Chinese bird very probably travels overland. Only one example was taken at Shaweishan, and that was on the autumn migration. The birds seen in autumn are all in red plumage with short tails. In spring most of the males have the long central rectrices, and breed in the red plumage as well as in the white. The latter plumage, which is that of the old males at least two years old, is without doubt moulted at the end of the summer before the autumn migration begins.

65. **Pratincola torquata stejnegeri** Parrot.

Pratincola indica D. & O. p. 167.

Pratincola maura La T. p. 571.

The Eastern Stonechat is an extremely common migrant in north-east Chihli, and passes from early May to the end of the month, and again from the middle of August to the end of September or beginning of October.

66. **Saxicola pleschanka** Lepechin.

Saxicola morio D. & O. p. 166 ; La T. p. 570.

The example recorded by me in 'The Ibis' as shot on the 27th of April, 1913, is the only one I have seen here. It was obtained on the island, and had probably accompanied a party of Stonechats which were here that day.

The Chinese White-capped Chat is said by Père David to be a summer visitor to the mountains of Chihli. The migration route usually followed must, of course, be entirely inland, and the bird mentioned above was a straggler to the coast. It probably breeds in the vicinity of Chinwangtao.

67. **Rhyacornis fuliginosa** (Vigors).

Rhyacornis fuliginosa D. & O. p. 166.

I have a single female example of the Plumbeous Water Redstart, which was shot in January 1912 in the Shanhaikuan mountains. This is the only example obtained by me during a seven years' stay at Chinwangtao, but I believe that the bird has been obtained in the Tung Ling.

The specimen obtained has the flanks more uniformly grey than females from Fohkien, but is otherwise similar. It was identified at the Natural History Museum by Mr. Ogilvie-Grant.

68. **Ruticilla aurorea** (Pallas).

Ruticilla aurorea D. & O. p. 170, pl. 26 ; La T. p. 571.

The Daurian Redstart is one of the first insectivorous Passeres to appear at the port in spring. It may be seen throughout March and in early April. One was seen in 1913 as late as the 19th of April. It pairs again during the first ten days of October. It is common during summer in the mountains, and breeds there in holes of walls and rocks. A single egg without any nest was brought to me from the country, about twenty-five miles north of Chinwangtao, on the 11th of May, 1917, and seven clutches with nests on the 11th, 15th, 16th, and 23rd of May, 3rd of June, and 2nd and 15th of July, 1917. This last clutch was much incubated and somewhat stale, and must have been taken several days previously. The single egg and the four clutches brought on the 11th and 23rd of May, 3rd of June, and 2nd of July have the ground-colour white and show very little gloss ; three clutches received on the 15th and 16th of May and on the 15th of July are pale green and glossy. This bird thus lays two very different types of eggs : one, with whitish ground-colour, tinged with orange when the shells are still fresh, speckled or stippled and sometimes blotched with more or less pale burnt sienna over underlying spots (sometimes blotches) of reddish violet. There is almost invariably a ring round the large end, sometimes a cap, the apex being more lightly marked ; and one, which is glossy, with a pale bluish-green ground-colour, speckled or occasionally blotched with pale burnt sienna over underlying reddish violet. The shape of the white eggs varies from ovate and narrow ovate to oval ; that of the green ones is ovate in two clutches, the eggs of the third clutch being broad ovate or broad oval. Twenty-one white eggs measure from 0·72 × 0·54 in. to 0·77 × 0·56 in. (another smaller egg being 0·69 × 0·56 in.). They average 0·75 × 0·54 in. Sixteen green eggs measure from 0·70 × 0·54 in. to 0·77 × 0·62 in., and average 0·74 × 0·57 in. The clutches collected comprise five or six eggs : two white and two green clutches having five eggs each, and two white and one green clutch six eggs each.

The nests were shallow rough pads or cups made of moss, soft grass strips, and feathers (pheasants' and, in one instance, domestic fowls'). They were all taken from holes in walls or rocks.

A male nestling has brown upper parts, the feathers edged with black and centred with dull buff, rump lighter, upper tail-coverts rufous, the feathers edged with blackish, lesser wing-coverts like the back, larger wing-coverts tipped with dull buff, wing-quills edged with dull chestnut, central tail-feathers dark brown tipped with chestnut. The under parts are dull pale buff, breast and flanks darker, the feathers edged with blackish, under tail-coverts light rufous (a bird dated 23rd of May).

A full-fledged young male is very similarly coloured, and has a large white patch on the secondaries. The tail and innermost secondaries are broadly edged with dull pale chestnut (date about 2nd of June).

A young male of the year had the head and upper back ash-coloured, the basal part of the crown-feathers being white (date 4th of October).

69. **Cyanecula suecica** L.

Cyanecula cœrulecula D. & O. p. 234; La T. p. 571.

The Red-spotted Blue-throat is a very common migrant in north-east Chihli and is specially abundant in spring. It passes in May from about the 9th to the 24th, and on the return passage from about the 10th of September to the middle of October. It is a sparse winter visitant to south-east China.

A female shot here on the 15th of May has the chin and malar region blue; the throat is white mixed with black towards the chin, and there is a band of blue on the breast.

70. **Calliope camschatkensis** (Gm.).

Calliope camschatkensis D. & O. p. 235; La T. p. 571.

The Common Ruby-throat is scarce at Chinwangtao in spring, when it passes in May. During the autumn passage it is very abundant, and passes then from about the 10th of September to the end of that month. The popular saying among the Chinese regarding this and the preceding species is: "Ch'un lan, Ch'iu hung" (in spring the blue, in autumn the red).

The female of this bird is generally described as having the throat white, but old females have sometimes a considerable amount of the ruby colour. Two of these birds taken at Shaweishan on the 8th of May and 27th of October have the throat as richly coloured as young males, while two others taken in the same locality on the 1st of May and 29th of October have the edges of the feathers just tinted with red. The general plumage of these four birds is that of the adult female. Mr. Stejneger (Proc. U.S. Museum, vol. xv. p. 321) mentions a female examined by him which has the ruby throat, and Professor Lönnberg (Journ. Coll. of Sci. Imp. Univ. of Tokyo, vol. xxiii. art. 14, p. 33) writes of another from Saghalien that it had "the throat white and somewhat washed with scarlet."

71. **Ianthia cyanura** (Pallas).

Yanthia cyanura D. & O. p. 231.

Ianthia cyanura La T. p. 571.

The Blue-tailed Robin is a very common migrant in north-east Chihli, and numbers pass Chinwangtao in spring and autumn from the beginning of April to mid-May, and from the latter half of September to the beginning of November (latest record 9th of November).

This bird is one of the earliest insectivorous Passeres to appear at Newchwang in spring.

72. **Merula obscura** (Gm.).

Turdus obscurus D. & O. p. 153.

Merula obscura La T. p. 571.

The Grey-headed Ouzel passes sparingly throughout May and at the beginning of June. In autumn I have observed it from the 14th to the 24th of September.

A living adult male example, brought down in September 1915 from Chihfeng in north Chihli and given to me by Mr. A. L. Hall, lived in good health and preserved its colouring until October 1917, when I released it on my leaving Chinwangtao. This bird was principally fed on bread and milk and raw beef, but also ate small millet, insects, grapes, and the fruit of *Cratægus pinnatifida*. It remained very shy almost to the last, and I never heard it utter any sound but its cry of alarm.

N.B.—*M. pallida* (Pall.) most probably occurs here also on migration, but I have not procured any specimens.

[To be continued.]

XXIV.—*Some Observations on the Birds of Islands of Milos, Lemnos, and Imbros, Ægean Sea.* By J. H. Stenhouse, M.B., R.N.

The following notes are based on observations made during the winter season of 1915–16 in three islands of the Greek Archipelago—viz., Milos from 25 November to 13 December; Lemnos from 14 December to 23 December; and Imbros from 25 December to 21 January. Of these islands, Imbros lies nearest the European coast, being about 12 miles from the Dardanelles; Lemnos is 30 miles away to the south-west and about 40 miles due south of the Greco-Bulgarian coast; while Milos is the south-western island of the group, being about 60 miles off the south-eastern coast of Greece and 70 miles north of Crete. Owing to the difference in latitude, Milos has a much milder winter climate than either of the other two. Lemnos is very bare, with hardly a tree. Imbros is better covered with vegetation, and pines grow in places on the hills. Milos is a volcanic island in which activity is not yet at an end. It is roughly horseshoe-shaped, and the northern half has only a few olive-groves to break the monotony of its surface, though there are many vineyards. The southern half is mountainous, rising to well over 2000 feet, while there are a considerable number of pines and other trees on this side. The lack of woods limits to a great extent the number of resident birds, and those observed were chiefly winter visitors. In the migration seasons Lemnos at least (and doubtless the other islands also) is visited by great numbers of continental birds on their way to and from Africa.

The birds observed were :—

Corvus corax subsp. ? Raven.

Seen in all three islands and usually in pairs. This bird is probably resident.

Corvus cornix subsp. ? Hooded Crow.

In Milos they were generally in pairs. Many frequented the limestone sea-cliffs north of the harbour, and were very light in colour. They are doubtless resident on the island. In Lemnos the bird was regularly seen ; generally solitary and very wary. In Imbros there were two large flocks, which were quite easily approached. These were much darker than the Milos birds, and in all probability were northern migrants.

Corvus corone corone. Carrion-Crow.

One was seen at Imbros on two occasions with a flock of "Hoodies."

Corvus frugilegus subsp. ? Rook.

Two were seen in Imbros with a flock of Hooded Crows.

Cervus monedula subsp. ? Jackdaw.

This bird was seen at both Lemnos and Imbros. In the former island there was a large flock ; in the latter island there were many constantly accompanying both flocks of "Hoodies." They were not "*collaris.*"

Alauda arvensis cantarella Bp. Skylark.

♂. Lemnos, 16. xii. 15. ♀. Imbros, 31. xii. 15.

Flocks were common in all three islands. In Milos they were very wild, having been much disturbed by "Alouette" hunters. In Lemnos and Imbros they were quite easily approached. Out of eleven shot on 31 December, six had wings measuring 115 mm. and over, and five wing-measurements between 105–108 mm.

Lullula arborea flavescens. Wood-Lark.

♂. Imbros, 11. i. 16. ♀. Imbros, 11. i. 16; 7. i. 16.

Was seen only at Imbros and was not uncommon. The birds were in parties of about half-a-dozen, and were usually met with on low cultivated ground; but the first seen were high up on a rough hillside.

Galerida cristata cypriaca. Crested Lark.

♂. Lemnos, 19. xii. 15; 23. xii. 15. ♂. Milos, 26. xi. 15. ♂. Imbros, 27. xii. 15.

♀. Milos, 4. xii. 15. ♀. Lemnos, 18. xii. 15; 23. xii. 15.

Fairly common in all three islands. In Milos the birds were shy and specimens were not easily obtained, probably the result of too many attentions from the "Alouette" hunters; in that island they frequented the rough scrub near cultivation as much as fields or vineyards. On Lemnos and Imbros they were very tame, and usually found in the neighbourhood of farm-buildings. Dr. Hartert has kindly examined my specimens, and says they seem to belong to the above race.

Chloris chloris mühler. Greenfinch.

♂. Imbros, 17. i. 16. ♀ juv. Imbros, 17. i. 16.

Was seen only in Imbros. A single bird was noticed on 14 January, and on 7 January a flock of about twenty was met with on sandy ground near the sea. They were very quarrelsome when feeding and allowed a near approach. It is surprising none were seen in Milos. This bird (subsp. *aurantiiventris*?) breeds in Crete.

Fringilla cœlebs cœlebs. Chaffinch.

♀. Milos, 5. xii. 15; 7. xii. 15.

Common in all three islands, and probably resident. In the flocks seen both sexes were present though females predominated.

Carduelis carduelis härmsi. Goldfinch.

2 ♂. Milos, 1. xii. 15. ♂. Lemnos, 19. xii. 15. ♀. Milos, 1. xii. 15.

Numerous in all the islands. In Milos the birds formed flocks by themselves; in Lemnos they were associating with Serins and Linnets and in Imbros with Linnets. One flock seen at Milos consisted of at least 200 individuals; they were very noisy when settling down for the night. They are probably resident in all the islands, though but few can breed in Lemnos on account of the scarcity of trees. Dr. Hartert writes: "I consider these to be *C. c. härmsi*, which is the latest name for *brevirostris* and *minor*, both names being preoccupied."

Carduelis carduelis loudoni.

♂. Milos, 1. 12. 15.

Dr. Hartert writes of this specimen: "This bird is more reddish than any *härmsi* that I have before me; it agrees with our *C. c. loudoni*, received from London, which is said to nest in N.W. Persia and winters at Lenkoran."

Carduelis cannabina mediterranea. Linnet.

♂. Imbros, 3. xii. 15. ♀. Imbros, 3. xii. 15.

Was present in all the islands. In Milos the birds were very shy and were in company with Serins. In Lemnos they were accompanied by Serins and Goldfinches and in Imbros by Goldfinches, being much more easily approached.

Serinus canarius serinus. Serin.

♀. Milos, 4. xii. 15.

Was fairly common. In Milos the birds consorted with Linnets; in Lemnos with Linnets and Goldfinches; while in Imbros those seen were in a flock by themselves. It is doubtful if they are resident.

Passer domesticus subsp.? House-Sparrow.

Was noticed only in Imbros, where there were a few in the villages.

Emberiza calandra græca. Corn-Bunting.

2 ♀. Milos, 9. xii. 15. 2 ♀. Imbros, 31. xii. 15.

Was seen only in Milos and Imbros. In the former island a flock of about thirty was seen on 1 December and again on 9 December. In Imbros it was fairly common in small parties, and appeared to be accompanying the flocks of Skylarks. One was shot out of a flock of those birds. These Buntings were quite silent.

Emberiza cirlus. Cirl Bunting.

♀. Imbros, 30. xii. 15. Sex? Imbros, 25. xii. 15.

A small flock was seen at Lemnos on 16 December. In Imbros they were fairly common on the low grounds near the sea. They spent much of their time searching for food under bushes, and were therefore difficult to obtain unless first disturbed, when they usually settled on the tops of other bushes near.

Anthus pratensis. Meadow-Pipit.

♂. Milos, 5. xii. 15. ♀. Imbros, 27. xii. 15.

Was recognised only in Milos and Imbros. In the former island individuals were met with close to the sea-shore and singly. In Imbros they were in small flocks, frequenting rough ground near cultivation. A large flock of Pipits seen high up on the hillsides at Lemnos may have been Water-Pipits; they were very wild and no specimen was secured.

Motacilla alba. White Wagtail.

Was fairly common on all three islands.

Motacilla boarula boarula. Grey Wagtail.

Several were seen at Milos close to the sea-shore.

Parus major peloponnesius. Great Tit.

♀. Imbros, 14. i. 16.

Seen only at Imbros. One was found searching the branches of a poplar-tree on 14 January, and proved to be a female. Two others were seen on 21 January after colder weather. About this time there was a large influx of birds into the island; the European shore to the north was well covered with snow.

Parus cæruleus cæruleus. Blue Tit.

♂. Imbros, 25. xii. 15. ♀. Imbros, 25. xii. 15.

Two were seen at Imbros on 25 December, and proved to be a pair. Another was seen on 14 January, and several in an olive grove on 21 January.

Sylvia melanocephala. Sardinian Warbler.

Was seen on several occasions in Imbros. A darker Warbler was seen twice in Imbros and once in Milos; it skulked so persistently that it could not be identified, and all efforts to secure a specimen were failures.

Phylloscopus collybita collybita. Chiffchaff.

♂. Milos, 28. xi. 15. ♀. Milos, 11. i. 16.

On 28 November, during a spell of very cold weather, three Chiffchaffs were seen in Milos. They appeared to have just arrived, and were searching for food along the stone walls and low down in oleanders. Later, several were seen among the pine-trees on the south side of the island. None were seen in Lemnos. In Imbros on 11 January, a lovely warm day, two were met with fly-catching from high oleanders on the banks of a stream, and one was secured.

Phylloscopus collybita tristis.

♀. 14. i. 16.

On 14 January a Siberian Chiffchaff was found with a Great Tit and a Blue Tit searching the leafless branches of a poplar-tree.

Prunella modularis modularis. Hedge-Sparrow.

♂. Imbros, 27. xii. 15.

Observed only at Imbros. Three were seen altogether and one obtained.

Erithacus rubecula rubecula. Redbreast.

♂. Milos, 7. xii. 15.

On Milos six Redbreasts were seen, and one procured proved to be the typical form; they were as a rule very shy. One was heard singing there on 7 December.

Erithacus rubecula xanthothorax?

♂. Lemnos, 23. xii. 15. ♂. Imbros, 21. i. 16.

Dr. Hartert writes: "I am by no means sure about them. Could they not be very fresh-plumaged *E. r. xanthothorax*? They were described from Rhodes (February specimens), and had the upper side rather more olivaceous, the throat a little more yellowish. I almost think they might be that." In Lemnos only one was seen skulking among oleanders; in Imbros, Redbreasts were fairly common and quite confiding.

Phœnicurus titys. Black Redstart.

♀. Milos, 5. xii. 15.

Was common on rocky ground on all three islands. Very few adult males were among them.

Saxicola rubicola rubicola. Stonechat.

♂. Imbros, 30. xii. 15. ♀. Imbros, 25. xii. 15; 27. xii. 15.

Common in all three islands and nearly always in pairs. These birds are in all probability resident.

Turdus pilaris. Fieldfare.

♀. Milos, 28. xi. 15.

Three were seen in Milos after the cold snap on 28 November. They were very easily approached. The stomach of one shot contained a few small land molluscs and the remains of berries.

Turdus musicus musicus. Song-Thrush.

♀. Imbros, 14. i. 16.

Seen only in Imbros, where a few very wild birds were put up among the scrub on the hillsides. On 21 January, after the snowfall on the mainland, their numbers were greatly increased, but they were still very shy.

Turdus merula aterrima. Blackbird.

♂. Imbros, 21. i. 16.

Two, a pair, were seen in Milos and two males at Lemnos. All were skulking and shy. In Imbros this bird was much more plentiful, and many arrived after the snowfall about 20 January. They were not easily approached, and a female could not be secured.

Athene noctua indigena. Little Owl.

♀. Milos, 9. xii. 15.

Was observed in all the three islands. In Milos these birds inhabit the rough stone walls which face the terraces of the vineyards.

Vanellus vanellus. Lapwing.

Was present in small numbers in Milos on 25 November, but disappeared on the arrival of the cold snap on 28 November, and was not again seen. It was not observed on the other islands.

Charadrius alexandrinus alexandrinus. Kentish Plover.

2 ♀. Imbros, 17. i. 16.

Seen only in Imbros, where a few were found at the edges of a salt-water lagoon.

Tringa alpina alpina. Dunlin.

♂. Imbros, 17. i. 16. ♀. Imbros, 17. i. 16.

Met with only in Imbros and at the same salt-water lagoon.

I am much indebted to Dr. Hartert and Dr. Eagle Clarke for having kindly examined my specimens from these islands, which are now in the collection at the Royal Scottish Museum.

XXV.—*On some Western Australian Birds collected between the North-West Cape and Albany* (950 *miles apart*). By THOMAS CARTER, M.B.O.U., M.R.A.O.U. *With Nomenclature and Remarks by* GREGORY M. MATHEWS, M.B.O.U., M.R.A.O.U.

As the collections of bird-skins made by me in 1916–17 in some of the south-west, mid-west, and north-west-areas of Western Australia have at last arrived in England, after a long delay caused by the marine risks prevailing during the last few years (see 'Ibis,' 1917, p. 587), Mr. Mathews and I now publish notes and remarks on birds obtained and observed in localities north and south of Shark Bay during the above-mentioned visit, as well as on two short trips that I made to the Gascoyne and Point Cloates districts in 1911 and 1913, and on a tour through the south-west of Western Australia in 1919, from which I have recently returned. The following itinerary may be interesting as describing the varied means of transit used :—

Left my station at Broome Hill in South-West Australia 30 July, 1911, hoping to revisit my original sheep-station at Point Cloates and the North-West Cape peninsula, where I had lived for thirteen years, and to search for the nests and eggs of *Stipiturus malachurus ruficeps* and *Eremiornis carteri*, which at that date were undescribed. I travelled two hundred and fifty miles by railway to Perth, then sailed by steamer six hundred miles to Carnarvon, arriving on 5 August. Eleven days were spent there searching through the mangroves and coastal scrubs, and also the timber and scrub on the banks and islands of the large Gascoyne River, which, as usual, was not running at the time ; but there were some pools in its wide sandy bed, and considerable bird-life around them. Left Carnarvon 16 August by five-horse mail coach, and arrived at the Minilya River Station (eighty miles north) on the 18th. There the late owner, Mr. Donald McLeod, most kindly lent me a pair of horses and buggy, and I proceeded sixty miles north, reaching Maud's Landing on the 23rd. Owing to a severe drought then prevailing, the whole country was almost denuded of grass, and travelling along the coast was extremely hard upon the horses, owing to the loose dry sand and constant steep hills, also of sand. It was impossible to obtain any fresh animals, as I hoped to do, or any chaff or horse-feed, and as the forty odd miles between there and Point Cloates was by far the worst and heaviest piece of road anywhere, I reluctantly gave up the idea of proceeding further north. So after resting the horses for ten days, I proceeded inland for about fifty miles, camping one night at an artesian bore, where the overflow formed a considerable swamp, and from there worked back to the Minilya, getting some specimens daily; then after a few days at the Minilya, waiting for the mail coach, I left by it for Carnarvon, and took a steamer for Fremantle and the south on 30 September.

On 3 August, 1913, I left Broome Hill to have another attempt for the North-West Cape, travelling by train to Geraldton, about five hundred and fifty miles. From there I sailed by steamer to Carnavon, arriving on 10 August; and after a few days spent in old haunts, I travelled by mail coach drawn by six camels to the Minilya River, and thence by mail buggy drawn by two camels to Point Cloates, on 23 August. There I was so fortunate as to meet Mr. W. Bryan, an old pearler, who was starting the next day for the vicinity of the North-West Cape, in an open 16-foot boat, to try to get some dugong for their excellent meat and oil. He gave me and my "swag" a passage to the Yardie Creek (*alias* Jacob Remessen's River of the Dutch explorers of 1620), while I undertook to show him the best channels through the many dangerous reefs, and also safe anchorage for his boat, as he did not know that coast. He landed me at the mouth of the Yardie on 26 August to camp alone until he returned from further north in about ten days' time. As this is the type locality where both *Stipiturus malachurus ruficeps* and *Eremiornis* were obtained by me in 1898, and both were fairly common until I left Point Cloates in 1903, I hoped to find the nest and eggs of one or both of the birds. However, although I systematically searched the narrow flat between the ranges and the sea, and most of the deep rugged gorges of the ranges, where large masses of Spinifex (*Triodea*) used to grow, I never saw a single specimen of either bird, probably because most of the dense low coastal scrub and larger masses of Spinifex had been burnt off in the meanwhile.

The range begins about two miles from Point Cloates, and extends north for seventy-five miles, terminating at the bluff of Vlaming Head. It is from five to six hundred feet or more in height all the way, and contains numerous deep gorges with precipitous cliffs, so that it is almost waterless, very tiring country to work, and exceedingly severe on boots. Its western side is within a mile, or less, of the sea, and between them is a narrow flat, with scrub and Spinifex. Strong hot gales from the east, with dust storms, also blew daily until noon during my visit, making small birds keep close to cover and difficult of observation. The boat called for me on 5 September, and we reached Point Cloates on the 7th, passing through the large whaling fleet stationed north of that place, and seeing some of the powerful tugs pursuing "Humpback" Whales and shooting them with bomb-harpoons. As the manager of the Company kindly offered to give me a passage to Carnarvon in one of the tugs that was starting on the evening of 12 September for mails and stores, I arrived there early the next morning, having made the passage in sixteen hours, as against the eight days it would have taken me by road. I was at Carnarvon for three weeks, the greater part of which time was spent on or near the coast, observing the arrival of great numbers of the Charadriiformes from their breeding-grounds in North-East Asia. The two new subspecies *Alisterornis lanioides carnarvoni* and *Acanthiza inornata carnarvonensis* were also obtained at this time. I sailed for Fremantle and the south on 4 October.

As business in connexion with my Broome Hill property necessitated my leaving England for West Australia in November 1915, and Mr. Mathews had asked me if I would try to obtain specimens of the long-lost *Malurus leucopterus* and *Amytis textilis* after my business was completed, I thought it would be a good opportunity to make a third attempt to obtain breeding notes of *Stipiturus malachurus ruficeps* and *Eremiornis* in the vicinity of the North-West Cape as soon as the Australian summer was well over. Meanwhile I revisited Lake Muir—a fine sheet of brackish water about twelve miles by six in the extreme south-west, and was there a fortnight, and then worked through that area, staying a few days at localities on the Upper and Lower Blackwood River, and also on the Margaret, Vasse, and Collie rivers. Several days were also spent in the vicinity of Cape Mentelle, near where I had seen *Sphenura longirostris* and *Psophodes nigrogularis* in 1903; but most of the coastal country had been burnt bare of the former dense scrub, in order to "improve" it for cattle-grazing, and apparently the above interesting birds have been exterminated from that locality. Some of the large lakes and swamps where many water-fowl abound, within a twenty-mile radius of Perth, were also visited; and on 19 April I sailed for Shark Bay and Dirk Hartog Island (for accounts of which see 'Ibis,' October 1917), leaving there on 27 May by steamer for Carnarvon, where I stayed three weeks. I had the pleasure of seeing the great Gascoyne River come down in full flood, filling the dry sandy bed (about three-quarters of a mile wide) with from twelve to twenty feet depth of water, from bank to bank, in a few hours' time. On 17 June I sailed in a schooner for Maud's Landing, arriving on the 19th, expecting to be able to travel to Point Cloates with the fortnightly mailman; but he arrived several days late with only a pack-horse, as the three rivers between there and Carnarvon—viz., the Lyndon, Minilya, and Gascoyne—were all running bankers and impassable for vehicles. It seemed as if I should again be disappointed in reaching the North-West Cape, but after a few days, by great good fortune, a carpenter turned up to effect some repairs on the jetty, and I was able to hire his strong and "roomy" buckboard buggy, with pair of horses and full camping outfit, for a term of two months; so I lost no time in proceeding to Point Cloates, and called on the lighthouse-keeper, Mr. Stuart, who was an old friend. He was seriously unwell, and asked me if I would stay at the lighthouse and help the assistant keeper to keep things going there, while he went in one of the whaling tugs to see the doctor at Carnarvon, and either returned himself or send up another man to take his place; so I was "hung up" there for three weeks, which delay in a great measure spoilt the trip. I did not like to lose so much time from my two months' hire of the buggy, but I was able to do some collecting, and the horses, which were in poor condition, improved very much before I proceeded north again on 17 July, reaching the Yardie Creek on the 19th, where I camped for a week, again without seeing a single *Stipiturus* or *Eremiornis*. Much of my time was daily occupied in having to find my horses, which were hobbled out to graze where they liked; then having to lead them two miles up the rugged stony ranges and down a very nasty piece of broken cliff, as near as I could get them to one of the pools of water, the "nearest" being within about two hundred yards of boulders and rocky steps. As these two horses were frightened and nervous and would not go any further, I had to cross this intervening space with a bucket, fill it at the pool, and scramble and climb back to the horses with it. They usually required four or five bucketsful between them, and some water was always spilt. Then I had to fill my two-gallon canvas water-bag for a day's supply for myself and lead the horses back to the camp. I also had to shoot a kangaroo, wallaby, or something for meat and do my own cooking. Leaving the Yardie on the 26th, I went on northwards, having to dig down several feet in loose running sand near the beach for the next supply of water for the horses and myself. The "digging" was done by a large conch shell. I can recommend this work as a good test for anyone's temper, as the sand invariably "caves" in several times, just as the water is reached. The next day I was so fortunate as to meet two old blackfellows who had been "station hands" for me at Point Cloates, and wished they had turned up sooner, as they could have taken a lot of the above work off my hands. Our next camp was nearly twenty miles further north, and the water was about fifteen feet down a narrow fissure in solid rock. The horses drank it, but it was too brackish for us; and we had to drive four miles down the flat every day, tie up the horses with the buggy, and climb about three hundred feet up the ranges to a rock hole, or "soak," on the bare rocky surface, where we filled the water-bag, bucket, and all available utensils that would hold water to take back to the camp. It was a most interesting sight at this tiny water-hole to see scores of *Emblema picta*, *Lophophaps ferruginea*, *Ptilotis keartlandi*, and other species assuaging their thirst. As I obtained a specimen of *Eremiornis carteri* near our camp, we remained a few days, but saw no more. The bird was a breeding male, feeding in the large bunches, sometimes breast high, of Spinifex, which is their favourite haunt. Proceeding north again, we camped for three days while I "worked" some large mangrove swamps, which had given good results in former years, but held very few birds on this occasion. On 5 August I reached my "farthest north" point at a sheep station not far from Vlaming Head and the North-West Cape, where I was most hospitably received by Mr. A. Campbell, and stayed a few days. This is where I shot a *Chlamydera maculata* with a 450′ Colt's revolver in 1892, and afterwards had seen none of these fine birds; but in company with my host I was able to obtain some further specimens, as will be described later in this paper. As my time-limit for the hired buggy would not allow me to round the North-West Cape and revisit the Exmouth Gulf country, as I had hoped to do, I reluctantly turned south on 10 August, and camped again at the place where I had shot the *Eremiornis*. A native and I carefully searched some large patches of Spinifex for two days, but failed to find a nest. I then drove alone back to Maud's Landing, where I was fortunate in meeting an old squatter friend, Mr. Guy McLeod, who was driving a mob of three thousand sheep to his Minilya Station, and gave me permission to travel with him, the large waggon drawn by fourteen camels, with calico yard for sheep, and water-tank, food, etc., for the drovers, easily finding room for my outfit. The sheep started away early every morning, and the waggon followed them, sometimes on a bush "road," but mostly across open country. Mr. McLeod had his motor car with him, but most of the time it was fastened by ropes to the hind axle of the waggon, and I travelled in it, trying to keep it straight behind the waggon. There was often much Spinifex in large tussocks, occasional rocks, and sometimes thick scrub up to twelve feet in height, but wherever the waggon went, the motor car had to follow. Sometimes we would suddenly come to the edge of a steep declivity, and the camels had a cheerful way of going down it at a clumsy gallop, with the motor bounding after it in a most exhilarating way, over all and sundry obstacles, none of which I could see ahead of me on account of the waggon. However, I never *quite* capsized the motor, and we reached the Minilya on 30 August. I did twelve days' field-work there, and left on 12 September by mail coach drawn by five camels for Carnarvon. When forty miles south of the Minilya, I "stopped off" five days at a station owned by Mr. Harry Campbell, another old friend of mine, as when passing through his country by mail coach on previous excursions I had seen some undoubted *Climacteris* in some of the "Jam" (*Acacia acuminata*) timber that grew there, and thought they must be *Climacteris wellsi*, first obtained by Mr. Shortridge on the Upper Gascoyne River in 1908 (see 'Ibis' 1909, p. 650), when the breeding-habits were not known. My surmise proved correct, and I found the birds breeding, as described later in this paper. Mr. Campbell kindly motored me to Carnarvon on 18 September, and as the Gascoyne River had ceased flowing, the friendly aid of a camel, hooked on in front of the motor car, enabled us to cross the heavy sandy bed, about a mile in width, which is always very difficult for a motor to do unaided. I sailed from Carnarvon to Dirk Hartog Island on 27 September.

The trip from which I have recently returned was made in order to effect the sale of my station at Broome Hill. I left Liverpool 30 October, 1918, travelling by ss. 'Carmania' to New York; thence by railway to Montreal, Banff, and

Vancouver, "stopping off" a few days at Banff, and being "hung up" at Vancouver for seventeen days; thence I sailed 9 December *via* Honolulu, Fiji, and Auckland to Sydney, where the steamer and passengers were quarantined for a week on account of the influenza epidemic, then raging generally at all ports on the route. As the shipping strike had stopped all coastal traffic, I went across Australia by the Trans-Continental Railway to Perth, Western Australia, arriving 21 January, 1919. After completing my business, I made a collecting tour of eight hundred miles through the south-west area, mostly by motor car with Mr. J. Higham, the owner of the car, and a keen field-naturalist. Unfortunately, it was then the driest and hottest summer on record there; birds were in full moult, and we were much inconvenienced by disastrous bush-fires, that had swept about half the country traversed. I returned to Perth early in April with the intention of doing more field-work in Shark Bay and Dirk Hartog Island; but as the shipping strike still prevented coastal steamers running, and then influenza spread to Western Australia, making local travelling very difficult and unpleasant on account of the stringent health regulations, I reluctantly gave up my proposed trip and returned to England *via* the Suez Canal, being very fortunate in obtaining a berth that an intending passenger had thrown up at almost the last moment.

Dromiceius novæhollandiæ woodwardi.

When camped 3-4 September, 1911, at the artesian bore, which is situated in long red sand ridges with much scrub on them, about twelve miles east of Maud's Landing, Emus were coming to drink in great numbers the whole time at the rather extensive swamp caused by the overflow from the bore-pipe. The water at the pipe is so hot that I could not keep my hand in it, and is too salt for human use. My horses refused to drink it, and they were thirsty. Owing to the drought then prevailing, there was no other water available for the Emus for a long distance. The remains of dead Emus that had been entangled in the paddock-fence wires were constantly seen on this trip, and as no young birds were observed anywhere, it may be presumed that the adults refrained from breeding in such a dry season, which abstinence is customary, according to my experience. When at Maud's Landing on 21 June, 1916, a teamster brought in many eggs which he told me he had obtained about fifty miles eastwards, where Emus were then breeding freely. It was a good season, with abundant rains.

The south-western subspecies of Emu (*rothschildi*) was not uncommon about Lake Muir on my visits there in 1916 and 1919. One adult female shot there on 19 March, 1919, was quite devoid of fat, which is a rare occurrence, excepting in a drought. The general plumage of this subspecies is much darker than that of those from the north-west area. Emus are not liked in the south-west, owing to their eating the large seeds of the poisonous "Xamia" Palm (*Macrozamia*), and so spreading the plants by voiding undigested seeds.

Leipoa ocellata ocellata.

The Western Mallee Fowl still breeds in the south-western corner, from south of the Vasse River, and round all the south coast, and also in some of the districts east of the Great Southern Railway; but their breeding-places are being steadily reduced by the burning of the coastal scrubs, and the clearing and cropping of the eastern Mà-lock and other thick scrubby areas, for agricultural purposes. In February 1919 I flushed an adult in some scrub within one hundred yards of a selector's house where I was staying, fifty miles east of Broome Hill; and on 16 February, in the same locality, flushed two young birds, about the size of small pullets, from low scrub, close to the edge of a road along which I was driving at the time. One of them appeared to fly with difficulty.

Mr. Higham and I were hoping to find some of these birds when we camped near the mouth of the Warren River in March 1919, but although we saw many of their tracks under the dense "Stinkwood" thickets that they frequent so much, we did not see one of the birds. The end of summer is about the worst time to find any of them, as the breeding-season is then over and they wander away from their nesting-mounds, not returning much to them until they open them out for repairs early in winter. I may mention that the lower Warren district is extremely difficult to work on account of a dense scrub, much swampy country, and immense steep sand-drifts.

Ypsilophorus ypsilophorus rogersi.

Several Brown Quails were flushed at the Lyndon River on 27 August, 1916, and Mr. Guy McLeod told me that he and a friend had enjoyed some good shooting with them earlier in the year on the Minilya River flats, where they were very plentiful. A few were seen, and specimens (*sordidus*) obtained, close to Cape Leeuwin in March 1919.

Alphaturnia velox vinotincta.

The Little Quail was found breeding at Point Cloates on 11 September, 1913, when small young, capable of flying, were seen. Also on the Minilya River in 1916, when fresh eggs were taken on 9 September. Many of these birds were seen when driving north of Point Cloates. I have never observed this species in South-West Australia.

Geopelia placida clelandi.

Western Ground-Doves were very numerous in and about the bed of the Gascoyne River and breeding freely on 18 September, 1911.

Stictopeleia cuneata mungi.

Western Spotted-shouldered Doves were fairly common about river-beds and pools, but not so plentiful as the Ground-Doves. A good many were seen feeding in the bushes growing on the ranges at the Yardie Creek in September 1913. These birds were breeding about Carnarvon in September 1911 and 1913.

Phaps chalcoptera murchisoni.

Bronze-winged Pigeons are diminishing in numbers in the south-west as agricultural settlement advances and the "Jam" trees (*Acacia acuminata*) are cut down and destroyed.

The seeds of this small tree are one of the favourite foods of the bird. A good many were observed east of Broome Hill, and at one house I saw several, daily feeding with the domestic fowls on the grain etc. thrown out for them. Recently fledged young were seen at Broome Hill on 16 January, 1916.

Cosmopelia elegans neglecta.

Brush Bronze-winged Pigeons are rapidly becoming less in number in the south-west districts. At present they appear to be most numerous between Cape Naturaliste and Augusta, where several were seen in the coastal scrubs. They have a habit of coming out on the high roads, especially about sunset. On 21 March, 1916, I was hiding in tall rushes and scrub on the edge of a small "dub" of water near Busselton, hoping to see some Bronze-wings come in to drink at sundown, as is the custom of both varieties of these birds. After a while a large wild cat (*i. e.*, a domestic cat living in a wild state) came straight to the water's edge and had a long drink without noticing me. Soon afterwards another did the same, so I thought that I was well concealed. Then a pair of Brush Bronze-wings walked in sight, having quietly alighted at some little distance. The leading bird saw me at once, and stopped a few yards away from the water; so I surmised that these birds have a keener sense of danger than cats.

Lophophaps ferruginea ferruginea.

Red-plumed Pigeons were very scarce at the Yardie Creek in August 1913, only one party of three birds being seen during my ten days' visit. In 1916 they were plentiful there; also at other places on the ranges further north, in the vicinity of rock-holes of water, from which they never seem to go far away. The aboriginal name (Tallangee tribe) for these birds is "Kool-brit."

Ocyphaps lophotes whitlocki.

Western Crested Pigeons are now very much rarer in the Gascoyne district than they were thirty years ago. The only place where any were seen on my 1911, 1913, and 1916 trips was on a station sixty miles north of Carnarvon, where many patches of "Jam" trees grew. A good many were seen there about the wells.

Porzanoidea plumbea roberti.

The Western Spotless Crake is a very unobtrusive and shy species, not venturing much out of the shelter of dense rushes or grass. I have obtained specimens and seen the birds from Albany to Lake Craigie (about twenty miles north of Perth) in some of the numerous large reedy swamps and lakes. They were common in January 1916 in the large freshwater lakes near Lake Muir, and also in March 1919. An immature example, almost full grown, was shot there on 21 January, 1916. Mr. Muir informed me that his domestic cat occasionally caught one of these birds and brought it to his house. I have the skin of one so obtained. The loud harsh notes of these Crakes are more often heard than the birds themselves are seen. They are most frequently observed in the early morning or about sunset.

Microtribonyx ventralis ventralis.

On 17 April, 1919, large numbers of Black-tailed Native Hens appeared on the Vasse River, at Busselton, where I was staying at the time. Residents of that town told me that it was fourteen years since a similar irruption had occurred. Three of the birds that I shot were in good plump condition. When I was staying in Perth, during the second week of May, great numbers of these birds came to the artificial "lakes" of Queen's Gardens and Hyde Park, well within the city boundaries, and were there for a few days, but then disappeared. On 23 May I was staying with a friend about one hundred and forty miles inland (east) from Perth and we saw some hundreds of these "Swamp-Hens," as they are usually called, on the edge of a brackish lake, while other smaller parties were seen at various places remote from water. A few were noticed by me on 7 September, 1916, at a pool near the Minilya River, and I saw some of their eggs that had been obtained a few days before that date.

Gallinula tenebrosa magnirostris.

Western Black Moorhens are not uncommon in some of the numerous large swamps in the south-west, but appear to be local in distribution. Mr. Higham and I obtained several specimens in deep swampy pools near the mouth of the Warren River in March 1919, and lost others that were shot. It was a very unpleasant and sometimes risky proceeding to retrieve them, owing to deep water, unknown depths of mud, and treacherous weeds and rushes. There were also unlimited numbers of large water-leeches, and venomous black snakes abounded in the rushy edges of the swamps. However, Mr. Higham was always game enough to make an attempt to recover any birds that were shot in such places. This species occurs on some of the lakes in the neighbourhood of Perth, and we obtained specimens at Girgin, fifty miles north of that city. After a careful comparison by Mr. W. B. Alexander and myself of specimens of this bird from the Eastern States and West Australia, we agree that they are subspecifically distinct, as first shown by Mr. Mathews.

a. Ad. ♀. Girgin, 18 May, 1919. Bill dark green, yellowish tips; legs and feet olive-brown; knee-joint red.

b. Imm. ♀. Warren River, 28 March, 1919. Bill mottled green and black; base of lower mandible green; frontal plate *black*; feet and legs grass-green.

Porphyrio bellus.

The Blue Bald Coot is common about the swamps and river-banks of the south-west. When at the Warren River, Mr. Higham and I noticed one of these birds (presumably the same one) on several occasions feeding on a tussocky flat, and as we approached it by a cattle-path, it crouched down and allowed us to pass within a few feet. This was a very poor attempt at concealment, no use being made by the bird of large grass tussocks close to it. In Mathews's 'Birds of Australia,' vol. i. pt. 5, p. 238, the plate of a male bird collected by myself at Albany, 8 February, 1905, had green feet, legs, and joints, and in my description of an adult male the tarsi and feet are given as olive-green. There are three skins in my collection here, labelled respectively :—

a. ♂. Gordon River, South-West Australia, 4 April, 1911. Legs and feet yellowish pink, joints brown.
b. ♂. Lake Muir, 16 March, 1919. Feet and legs salmon-pink, joints greenish.
c. Imm. ♀. Albany, 26 December, 1913. Feet and legs reddish olive.

So there appear to be considerable variations in the colouring of these parts.

The aboriginal name for this species in the south-west is "Moolar."

Fulica atra australis.

Western Coots appear to be local in distribution in Western Australia, and are not common according to my experience. A pair was seen on the Vasse River, 12 February, 1916, a small party on a pool at the Lyndon River, 28 August, 1916, and one on a pool near the Minilya River on 5 September, while several occurred near the mouth of the Warren River in March 1919.

Podiceps cristatus christiani.

Australian Tippet-Grebes were seen on Lake Muir in March 1919, a small party of them keeping far out in the lake. No tippets were observed through my binoculars. Mr. J. Drummond, of Perth, told me he saw a specimen that was shot by one of a duck-shooting party at Chittering on 27 March, 1916, when he was one of the party.

Tachybaptes ruficollis carteræ.

Western Black-throated Grebes were observed at Lake Muir and other localities during my trip.

Poliocephalus poliocephalus cloatesi.

Western Hoary-headed Grebes were seen on a large pool on the Lyndon River, 27 August, 1916, and there were many adult and immature birds on the Vasse River in April 1919.

Petrella capensis australis.

When I was on Dirk Hartog Island, 4 October, 1916, there was an exceptionally heavy gale (for that district) blowing from the north to north-west. The Government "fish" steamer, the 'Una,' left Fremantle that evening for Shark Bay, but had to put back, owing to the tremendous seas outside. Mr. J. H. Mead, who at that time owned the Peron Peninsula sheep station, was a passenger on the 'Una,' which eventually arrived in Shark Bay on 10 October. He told me that when the steamer again left Fremantle the captain of it called his attention to the numerous "Cape Pigeons" that followed and flew around the 'Una' until close to Geraldton. The captain knew the birds well, and said he had never previously seen them off that part of the Australian coast. There are no details of any definite record of this species occurring in Australian seas in Mathews's 'Birds of Australia,' and his Reference List of 1913 states: "*Range. East* Australia and New Zealand seas"; so I think the above is worthy of record and is quite reliable.

? Nealbatrus chlororhynchus.

No Albatroses were obtained, but when going by whaling-tug to Carnarvon on 12 September, 1913, I saw a good many soon after getting clear of the Point Cloates reefs. The birds seen had dark blackish wings and backs, white heads, necks, and under parts, and, through my binoculars, their bills all appeared to be quite black, as is the case in *Nealbatrus chlororhynchus carteri*, which was got close there.

Chlidonias leucoptera grisea.

On 2 June, 1919, Mr. W. B. Alexander of the Western Australian Museum and I saw many Australian White-winged Terns flying and feeding over the tall rushes growing in Herdman's Lake near Perth. The first recorded occurrence of these birds in Western Australia was early in 1917 (see Mr. Alexander's account in 'Emu,' vol. xvii. p. 95).

Hydroprogne caspia strenua.

On 4 September, 1913, I found a young example, in down, of the Australian Caspian Tern at the mouth of the Yardie Creek. Other birds were breeding on the tops of bare sand-drifts at Point Cloates, 5 July, 1916.

Thalasseus bergii gwendolenæ.

Western Crested Terns were plentiful at Point Cloates and Maud's Landing on the three visits made there ; also at Cape Naturaliste and Cape Leeuwin, while a few were seen at Lake Muir, where a specimen was shot for identification.

Bruchigavia novæhollandiæ longirostris.

Western Silver Gulls were numerous on all parts of the coast visited. A good many were seen at Lake Muir in March 1919, where they sometimes breed on the small islands in the Lake.

Gabianus pacificus georgi.

The first date on which I saw Western Pacific Gulls at Carnarvon was in September 1913. They are not plentiful, but have now extended their range to Point Cloates, where none were seen during my thirteen years' residence. My own opinion is that they went there to feed on the carcases of the hundreds of dead whales that lay along the beach from Maud's Landing to the North-West Cape in 1913, the blubber having been stripped from them by the whalers on the factor ship who then set them adrift. Some of these birds were seen at the whaling station near Point Cloates on 6 September, 1913.

Arenaria interpres oahuensis.

A few Eastern Turnstones were seen at Point Cloates on 28 June, 1916.

Hæmatopus ostralegus picatus.

Pied Oystercatchers were common on all trips from Shark Bay to North-West Cape. This species is not nearly so numerous in the south-west as it is further north.

Zonifer tricolor gwendolenæ.

Western Black-breasted Plovers were constantly seen about Broome Hill and forty miles east of that place. Also at Woolundra and around there, one hundred and forty miles east from Perth, in May 1919. When staying at Busselton on the Vasse River in April 1919, I noticed small parties of them on grassy cleared land, and having never seen these birds before in that locality on my numerous visits there, I enquired of the farmer who owned the land how long the Plovers had been there. He told me that a pair of them had arrived a few years previously and that they had increased in numbers very quickly.

Squatarola squatarola hypomelas.

Eastern Grey Plovers were numerous and in flocks during the last week of September 1913 on the wide sand and mud-flats at the mouth of the north branch of the Gascoyne River. Many of them still retained much of the black plumage on their breasts. I never saw such a "wave" of waders returning from their breeding-quarters as there was during the above week.

Pluvialis dominicus fulvus.

A party of six Lesser Golden Plovers were seen at Carnarvon on 6 September, 1913, and by the end of that month the birds were very plentiful along the beaches.

Pagoa leschenaulti.

From 24 September, 1913, and the end of that month, Large Sand-Dotterels were seen in flocks on the tidal estuaries of the Gascoyne River and adjacent beaches. Many went further up the river, feeding on the edges of a large freshwater pool. I picked up a dead bird on the bridge of the light railway for the jetty, across the south branch of the Gascoyne River, that had evidently been killed by striking one of the telephone wires.

Eupodella vereda.

A small flock of Oriental Dotterels was seen on 2 September, 1911, on the large salt marsh at Maud's Landing. I was unable to obtain any specimens, as they were very wild. They had evidently just arrived, for I had crossed the marsh daily from 23 August without seeing any. When returning to Carnarvon by mail coach on the same trip on 13 September, I saw some of these Dotterels on a scrubby flat about thirty miles inland. The driver kindly waited while I tried to shoot a specimen, but I could not get within gunshot. When at Point Cloates on 8 September, 1913, the first party of these birds was seen on a salt marsh there.

Leucopolius ruficapillus tormenti.

A few Red-capped Dotterel were seen on 2 August, 1916, at a mangrove swamp south of the North-West Cape, and on 21 August I came upon four young birds, only just hatched and attended by the mother, on the salt marsh at Maud's Landing. Later in the day half-grown young birds were seen at the same marsh, which contained a few shallow pools of salt water. On 2 March, 1916, I saw many on the beach at Cape Mentelle.

Charadrius cucullatus tregellasi.

Western Hooded Dotterels were plentiful along the beach near Cape Mentelle in March 1916, and some were seen at Cape Leeuwin early in April 1919. When I shot one and only winged it, the remainder of the birds showed great concern for their wounded companion, and would not leave it until I walked among them to pick it up.

Elseya melanops melanops.

A few Black-fronted Dotterels were seen at Broadwater, near Busselton, on 15 February, 1916, and at a stock tank on my Broome Hill property on 8 January, 1916.

Himantopus leucocephalus assimilis.

A few Northern White-headed Stilts were seen at a pool near the Minilya River on 8 September, 1911.

Cladorhynchus leucocephalus.

No Banded Stilts were seen by me, but when at Carnarvon in 1916 Mr. Angelo told me that he had seen hundreds in 1915 at a salt marsh and mangrove creek there, and had shot several. Also that he had observed them on previous occasions at the same place.

Numenius cyanopus.

A party of nine Australian Curlews was seen at Carnarvon on 6 August, 1911, and many more in September of that year. On 11 August, 1913, these birds were fairly common at Carnarvon and they were very numerous late in September. Several were seen there on 5 June, 1916, and also at Point Cloates on 28 June, and a pair of them on 2 August near the North-West Cape.

Phæopus phæopus variegatus.

Eastern Whimbrel began to be numerous at Carnarvon by 16 September, 1913, on which date I shot three, which were all *females*, and had been feeding on small crabs obtained in a mangrove creek. By the end of that month they were seen in large flocks at the north mouth of Gascoyne River. On 5 June, 1916, several were seen at Carnarvon, and a pair occurred near the North-West Cape on 2 August. It is curious that I never saw any of these birds at Point Cloates; perhaps it is because there is no mud there.

Vetola lapponica baueri.

Eastern Barred-rumped Godwits were fairly common at Carnarvon on September 1913, and on 1 October were feeding with Whimbrels in large flocks. The Godwits seem to put the whole of their heads under water while feeding more often than most waders do.

Heteractitis incanus brevipes.

Grey-rumped Sandpipers were plentiful on the Carnarvon beaches during the last week of September 1913 and also on 10 June, 1916, when some specimens were obtained. A few were seen on 2 August, 1916, at mangrove flats a little south of the North-West Cape.

Actitis hypoleucus.

Common Sandpipers were more plentiful about Carnarvon in September 1913 than ever previously observed by me there. Two were seen on the Vasse River—12 February, 1916, and several at Carnarvon on 1 June, 1919, and also in September of that year. This bird continually "bobs" its head up and down.

Terekia cinerea.

Several Terek Sandpipers were seen at Carnarvon on 21 September, 1911, and specimens were obtained.

Glottis nebularius.

Two Greenshanks were seen at Carnarvon on 21 September, 1911, and one on 29 September at a freshwater pool in the river. Odd birds were also seen about Carnarvon in September 1913. I got very badly bogged there in trying to retrieve one shot in mangroves.

Rhyacophilus glareola.

Three Wood-Sandpipers were at the artesian-bore swamp, east of Maud's Landing, on 4 September, 1911. They were very wary, but one was shot for identification. This is the only occasion on which I have seen this species during my thirty odd years' residence in Australia. The scapularies of the above specimens are boldly "toothed" on the outer edges, and it looks as if the white marks, which presumably had been there to correspond with those present on the inner edges, have been either worn away or bitten out by the bird.

Crocethia leucophæa tridactyla.

Several Eastern Sanderlings were observed about Point Cloates at the end of June 1916, and one was seen at Cape Mentelle on 2 March, 1916.

Pisobia ruficollis.

Large flocks of Red-necked Stints were on the Carnarvon beaches the last week of September 1913. Many of them still retained some of the rufous breeding-plumage.

Erolia ferruginea chinensis.

Many Eastern Curlew-Sandpipers were seen about Carnarvon 21 September, 1911, and on 11 August, 1913. a flock of about fifty were feeding at the edge of a freshwater pool in the Gascoyne River two miles from the sea.

Canutus canutus rogersi.

Eastern Knots were fairly common at Carnarvon from 21 September, 1911, to the end of that month, and also during the same period in 1916. A specimen shot on 20 September, 1916, still retained some of the rufous breeding-plumage on its under parts and blackish feathers on the mantle.

Anteliotringa tenuirostris.

Great Knots were feeding with the above species, and specimens were obtained 20 September, 1911, and 20 September, 1916.

Glareola maldivarum orientalis.

I have a skin of an Oriental Pratincole sent to me for identification by Mr. G. Baston, who shot it at Maud's Landing 13 May, 1912. This species used to be seen by me at Point Cloates in stormy weather with northerly winds.

Orthorhamphus magnirostris neglectus.

A pair of this fine and very wary species, the Long-billed Stone-Plover, was seen on the beach on 5 September, 1913, a few miles south of Yardie Creek. After much trouble I shot one of them, but it fell far out to sea. Another pair was seen on 27 July, 1916, about twenty miles north of the Yardie Creek (at the shingly ridge where I found an egg of this bird on 24 October, 1900). As I could not get near the birds, I told the blackfellow with me to make a long detour past them, and slowly drive them towards me to where I was hidden behind a rock on the beach. The ruse was successful, and I obtained the female, which was breeding. Another pair was seen further north on 4 August.

Austrotis australis derbyi.

Owing to the drought in 1911, Australian Bustards were rarely seen, but they were plentiful in 1913 and 1916 from Shark Bay northwards. When I was enjoying the hospitality of Mr. Guy McLeod at the Minilya River in September 1916, he drove me out in his motor car in order to try to shoot a "Turkey" or two. The method employed is to "rush" the motor straight towards a feeding bird, so as to get within shooting range, and stop the car before the heavy creature can rise. We secured a fine Turkey that weighed 16 lbs. and was 7 feet in expanse of wing.

Carphibis spinicollis.

Straw-necked Ibises were numerous in the Minilya River district in August 1911, when a drought prevailed. On 1 September, 1913, I picked up the remains of an immature bird near one of the pools in the stony bed of the Yardie Creek. It must have been reared somewhere in that area the same year, but I saw no living Ibises on that trip. They were very plentiful on the Minilya Station in 1916, and in April 1919 I saw several about the Vasse River, mostly single birds or pairs. I was informed on good authority that this species made its first appearance in the Albany district in 1892, and caused much comment as to its identity; also that it was then plentiful about Cape Riche, fifty miles east of Albany. [The first recorded appearance of Straw-necked Ibises in Western Australia was at Derby, in the far north, by Captain Bowyer Bower in 1886, the next to the south at the Minilya River in 1888 (see 'Zoologist,' July 1889, Carter), and the first record of *breeding* in Western Australia was in October 1900 (see 'Zoologist,' July 1901, Carter).]

Platibis flavipes.

On 20 April, 1911, I shot one of a pair of Yellow-billed Spoonbills at a pool near the Minilya River, the only occasion on which I have seen this species; though for several years previous to that date I had been told of White *Ibises* having been seen; but I now think that Spoonbills had been mistaken for Ibises, as, when viewed at a certain angle, the beak of a Spoonbill appears to have the same curve as that of an Ibis.

Egretta garzetta immaculata.

A pair of Lesser Egrets were seen at a large pool on the Lyndon River on 28 August, 1916. I was unable to obtain a specimen, as they were very wary, but could plainly see their black bills and legs through my binoculars.

Demiegretta greyi.

On 26 August, 1913, a pair of White Reef-Herons was seen at the Yardie Creek. On 5 July, 1916, I shot a white specimen on the beach at Point Cloates, undoubtedly breeding. On 23 August, 1916, I took three fresh eggs from the nest of a pair of Blue Reef-Herons, built on a low cliff, fifty miles south of Point Cloates. When Mr. Higham and I were at Cape Leeuwin on 9 April, 1919, he shot a Reef-Heron, and when I compared it, in November last, with other specimens in my collection from further north, I found that it differed from any of them ; so I sent it on to Mr. Mathews with other examples, calling his attention to the differences. He described it as *Demiegretta matook carteri* subsp. nov. in Bull. B. O. C. vol. xl. p. 75.

Nycticorax caledonicus hilli.

Australian Night-Herons were extremely abundant, both in adult and immature spotted plumage, on the Vasse River in February and March 1916, but I did not see a single bird there in April 1919.

Butorides striata stagnatilis.

Only one Little Mangrove-Bittern was observed. It was a breeding male, and was obtained in some mangroves near Carnarvon on 23 September, 1911, but I could find no nest. As is usual with this bird, it was very wary, and after being flushed several times and eventually "marked down" in a small patch of mangroves, it assumed an erect position, with its bill pointing upwards, and was then difficult to see amongst the straight yellowish stems of the young mangroves.

Dupetor flavicollis gouldi.

A few Yellow-necked Bitterns were seen about the Vasse River, but they were not so common as in previous years.

Botaurus poiciloptilus westralensis.

The above note also applies to the West Australian Bittern.

Chenopis atra roberti.

Black Swans were numerous on Lake Muir in 1916 and 1919, while a good many were seen at Augusta (near the mouth of the Blackwood River) and also on the Swan River. The aboriginal name for this species about Lake Muir is "Mar-lee."

Casarca tadornoides australis.

Mountain Ducks were very scarce at Lake Muir in March 1919, where they usually occur in thousands, the reason perhaps being that the lake was fuller then than was ever previously known, and the water was almost fresh. This fulness of the lake was remarkable, as the 1918–19 season was most exceptionally dry and hot. These ducks were plentiful there in January 1916, when the water was very low and salt, so low that it was almost impossible to shoot any, owing to absence of cover from which to approach the edge. Very large flocks of these birds were seen on 24 May, 1919, at a salt lake one hundred and forty miles east of Perth.

Anas superciliosa rogersi.

Black Ducks were plentiful in the large freshwater lakes near Lake Muir in January 1916. I saw a brood of nine young in down only a few days old on 29 January, and Mr. Muir told me that he saw two similar broods on other swamps about the same date. In the south-west area this species usually breeds from July to September. From the middle of April until the end of May in 1919 there were hundreds of wild Black Ducks on the artificial pools in

Queen's Gardens, East Perth, and also in Hyde Park Gardens, North Perth. On one occasion I counted roughly six hundred of them on a pool about one hundred yards in diameter. They crowded to the banks to be fed on biscuits etc. by visitors and children, but would not actually feed from the hand, though I constantly had odd birds venture within three or four feet of my outstretched hand holding food out for them. On the approach of evening the birds all left the Gardens to feed on the shallow mud-flats of the adjacent Swan River, where they again assumed their usual shyness. As soon as the first winter-rains fell (in early June) they all left the Garden pools.

Virago castanea.

Green-headed Teal were very scarce at Lake Muir in January 1916, and difficult to obtain, owing to the lowness of the water. While I was there a shooting party obtained about six of them on a freshwater swamp adjacent to the lake. One of the party told me that these birds go to this small secluded swamp for shelter in windy weather. I did not see a single individual at Lake Muir in March 1919, perhaps because the water was then fresh and quite drinkable. When I was at Carnarvon in 1916, Mr. Angelo told me that he had often seen and shot Green-headed Teal in a large and deep mangrove creek some miles north of Carnarvon, but that he had never seen any *away from mangroves.*

Early in August 1916 I camped at a large patch of mangroves south of the North-West Cape, hoping to obtain some specimens and make observations, as I had often seen these birds there in previous years. However, there was only one pair, and after much trouble I shot one of them, just when it was almost dark, after sundown, at a range of a few yards. It was a female bird just assuming the chestnut-coloured breast, but had no green on its head or neck and was not breeding at the time. A few days afterwards, when I was staying with Mr. A. Campbell, who lives further north, he told me that he frequently saw

Green-headed Teal at these mangroves, and has obtained their nests and eggs. The nests are usually in the scrub and herbage around the mangrove swamp.

Virago gibberifrons rogersi.

Some immature Western Teal were shot at a pool (freshwater) twenty-five miles up the Gascoyne River on 14 September, 1913. A few were observed at Lake Muir in January 1916, but no specimens could be obtained, and others, with small young, were seen at a freshwater pool near the Minilya River on 10 September, 1916.

Stictonetta nævosa.

Some Freckled Ducks were shot on 14 September, 1913, on a pool in the Gascoyne River.

Nyroca australis.

On two occasions in May 1919 I saw a single White-eyed Duck swimming in the pools in Queen's Gardens, Perth, in company with hundreds of Black Ducks, as previously mentioned, but it was very shy and would not come near the banks.

Biziura lobata.

Musk-Ducks were common on all the lakes and swamps visited in the south-west area. In January 1916 immature birds of various sizes were noted in the freshwater swamp at Lake Muir. When I was sitting by the edge of one of these swamps, well concealed amongst some paper-bark scrub, I was one day able to watch an old drake "displaying" on the water. Its head was thrown well back, and its tail slowly spread upwards over its back; then by simultaneous movements the head was thrust forwards to the water, but apparently not *under* it, the widespread tail was jerked down to the water behind, and each foot thrust out sideways with outspread webs, just on the water surface, the result being a very resonant "plonk"; but what actually produced this noise it was impossible to decide—whether it was vocal or caused by tail and feet meeting the water.

Phalacrocorax carbo novæhollandiæ.

Black Cormorants were observed in the south-western districts, and some specimens obtained, but none of them had white patches on their thighs, perhaps because my trips did not coincide with the breeding-seasons.

Mesocarbo ater.

Little Black Cormorants were unusually plentiful round Carnarvon in September 1911, both in mangroves and at pools in the Gascoyne River. Several were observed lying dead, and upon post-mortem examinations were found to be in a very emaciated condition, with inflamed kidneys. A few of these birds were seen on the Vasse River in February 1916.

Hypoleucus varius perthi.

Pied Cormorants were common from Shark Bay and along the coast to North-West Cape. [Mathews's Reference List, 1913, includes South-West Australia in the range of both this bird and *Hypoleucus fuscescens*, and neither of them is given as occurring in Mid-West or North-West Australia, where *H. varius* is abundant. I believe that *H. fuscescens* has not been recorded west of Albany (if as far as there).]

Anhinga novæhollandiæ.

No Darters were seen on any of my trips until 2 June, 1919, when Mr. W. B. Alexander and I saw from twenty to thirty in the course of a walk round Herdman's Lake and an overflow from it. Most of those noticed were perched on snags, or dead trees in the water, with outstretched wings. It is rather curious that until the above date I had only seen one living bird during my long residence in Australia. Mr. Alexander told me that some of these birds can generally be seen at the above lake.

Sulita serrator dyotti.

No Australian Gannets were observed, and no one of the many persons with whom I conversed on the several trips could tell me of any having been seen along the south-west coasts to the west of Albany.

Catoptropelicanus conspicillatus westralis.

A few Western Pelicans could be seen almost daily about the mouths of the Gascoyne River, and on 13 September, 1913, I saw a flock of about one hundred.

Circus assimilis rogersi.

Lesser Spotted Harriers were common from Carnarvon northwards in 1913 and 1916, as they usually are there after good winter rains. On 8 September, 1911, I saw one of these birds strike a Brown Hawk down to the ground as it was passing in front. It seemed to be merely a wanton action, as the Harrier took no notice of the fallen Hawk.

Urospiza fasciata cruenta.

Lesser Goshawks were noted in most districts visited on my different trips. A particularly fine female was obtained by me at the Vasse River in February 1916, measuring: total length 500 mm., wing 320 mm. On 30 June, 1916, one shot at Point Cloates had its crop full of grasshoppers.

Uroaëtus audax carteri.

Western Wedge-tailed Eagles were occasionally observed, and are still fairly numerous; but they are gradually decreasing, owing to constant persecution. When at Maud's Landing in September 1911, Mr. C. French gave me an egg that he said he had obtained from a nest near that place on 12 August, which is late for this species to have eggs. In January 1916 the wife of a neighbour who lived close to my Broome Hill Station told me that she had recently had three fine tame geese killed by these birds close to her house. On 12 August, 1916, I climbed above a nest on a ledge of cliff in the ranges north of Yardie Creek, and saw two young birds in down in it. One of the parents had flown from the nest and circled round me, which called my attention to it. Several were seen about Augusta in March 1919, and when at Woolundra in May I saw one of these Eagles flying with something in its feet, which it eventually dropped as I approached. It was a freshly-killed full-grown rabbit.

Cuncuma leucogaster.

White-bellied Sea-Eagles were observed in several places from Shark Bay to the North-West Cape. Some were also seen at Augusta in March 1919. On 12 August, 1911, a pair of eggs was taken from a nest which Ospreys had originally built, not far from Maud's Landing. This nest was fully six feet in height, on a pinnacle of rock. On 26 August, 1913, I saw young birds in a nest on a high cliff at Yardie Creek, where these Eagles had reared their broods for many years, when I resided at Point Cloates. On this occasion I was taking a series of photographs of the wonderful creek, and several times, while standing on the edge of a high cliff, one of the adult Eagles came swooping from *behind* me, almost touching me with the tip of its wing as it passed. At last I became annoyed with the bird, as its actions might have led to a fatal accident, so shot it. It was a female, and the same afternoon I saw the male brooding over the young in the nest. On 26 June, 1916, I took two incubated eggs from a nest built on the edge of a cliff some miles south of Point Cloates, where these birds had nested for many years. When passing there on my return journey on 19 August, the same year, there was another pair of eggs in the nest, also much incubated.

When staying with Mr. Campbell near the North-West Cape in August 1916, he told me that he had several times seen a wholly white Sea-Eagle in the Exmouth Gulf just round the Cape. The aborigines also told me of it, giving their own name for it, "Tantagee," and were very anxious for me to shoot it, as being such a rarity.

Haliastur indus leucosternus.

White-headed Sea-Eagles are common along the coast from Carnarvon northwards, especially in the vicinity of mangroves. The aboriginal name in the North-West Cape district for this species is "Indee-narrangee." When at Carnarvon in September 1913 I frequently saw a party of four birds flying together, all in immature plumage, but they could hardly be one brood. On 1 August, 1916, I climbed to a nest about twenty-five feet above the water, in a large dead mangrove-tree a little south of the North-West Cape. The nest was bulky and made entirely of sticks, lined with small twigs. It contained one egg, much incubated.

Haliastur sphenurus.

The Whistling Eagle is fairly common about the Lower Swan River, but is not often seen south of that district. In the Gascoyne and more northern areas it is numerous, and was particularly so about the Minilya River in September 1916, where it was flying about in small flocks of twelve to twenty in number. It also was commonly seen there in September 1911, and was rather a nuisance at times, as on one occasion when I had shot a pair of Stilts (*Himantopus leucocephalus*) at a pool, a Whistling Eagle swooped down in front of me, and with its feet picked one of the dead birds off the surface of the water within a few yards of me. Another day I shot an Emu at the same pool and roughly skinned it. As I was carrying the skin on my shoulders, several of these Eagles followed me and kept making swoops down at it until I shot one of them. [Recorded in "Food of Diurnal Birds of Prey," Emu, vol. xviii. p. 93.]

Elanus notatus parryi.

Two Black-shouldered Kites were seen at a pool near the Minilya River on 1 September, 1916. Mr. McLeod told me that these birds had been very numerous there a few weeks before that date.

Falco longipennis murchisonianus.

Several Murchison Little Falcons were seen about Lake Muir in March 1919. They are more plentiful there than in any other locality I have visited.

Ieracidea berigora occidentalis.

Brown Hawks are by far the commonest birds-of-prey in Western Australia, and were seen daily. I shot one at Lake Muir on 21 January, 1916, that apparently had designs on the poultry at the homestead, but examination of its crop proved that it had been feeding entirely on various grubs and large caterpillars.

Cerchneis cenchroides unicolor.

Westralian Nankeen-Kestrels were observed in most districts, but most numerously in the mid-west. In 1911 these birds were dying from some disease about the Minilya River. I saw several dead, and Mr. McLeod told me that he had also noticed many.

[I have never seen a Kestrel resembling the *Cerchneis unicolor* of Milligan, or heard of any other similar birds being obtained, and consider that the figuring of that "sport" as the *Western* Kestrel in Mathews's 'Birds of Australia' is very misleading.—T. C.]

Pandion haliaëtus cristatus.

Only two White-headed Ospreys were seen in the south-west area—viz., one near the historic nest of Mr. A. J. Campbell at Cape Mentelle in March 1916, and one at the mouth of the Blackwood River in April 1919. This species is not common there, as it is further north. On 21 August, 1913, I saw two eggs in a nest near Cape Farquhar, and one on 6 September north of Point Cloates. On 13 July, 1916, I found a bulky nest, about three feet in length, built on bare sand at sea-level, within a few yards of high-water mark, near Point Cloates. It contained a handsome pair of eggs. Two other nests were built on the flat tops of iron windmill towers, the wheels not being attached at the time. I have three photographs by Mr. Geo. Baston, formerly living at Maud's Landing, of the nest of an Osprey built on the top of the crane at the end of the long jetty there, and I have two eggs that he took from that nest on 8 July, 1912. He told me when I was there in 1913 that on four occasions he had to pull down the nest in order to work the crane, but the birds persisted in rebuilding until the eggs were laid, when he was again obliged to destroy the nest, and they then left.

Spiloglaux novæseelandiæ mixta.

The Pallid Boobook-Owl occurs southwards to the Gascoyne River, where I obtained specimens on different trips, all of them being much paler than the south-west subspecies *ocellata* and easily distinguished from it. These birds fly far and strongly in bright sunlight.

Spiloglaux novæseelandiæ ocellata.

Western Boobook-Owls were occasionally seen in the south-west area.

Tyto alba delicatula.

Only one Barn-Owl was seen, which was flushed from the shade of a large white-gum tree at the Gascoyne River on 13 August, 1911. It flew a considerable distance in strong sunlight, and could not be again sighted.

Tyto novæhollandiæ perplexa.

While staying with a friend in Busselton in February 1916, I noticed the wings of a Western Chesnut-faced Owl on the wall of a room, and enquired their history. I was told that some time previously several of the domestic fowls had been killed from their perches out in the open behind the house, close to which the bush timber grows. A watch was kept, and the above Owl was shot in the act of seizing a fowl. When I was travelling from the Margaret River to Augusta on 10 March, 1916, by motor mail between 9 and 10.30 P.M., several miles of the Karri Forest were burning on each side of the road and right up to it. Many large Owls were observed, flitting about the road ahead of the car, and sometimes over it, within a few feet of us. They were white on the body, and in all probability they were of this subspecies; they were catching small animals that had sought shelter on the road from the fire. I distinctly saw one Owl alight on the ground a few yards ahead of us seize something and then fly away with it. Unfortunately, my gun was in its case at the bottom of the car, beneath the mails and other cargo, and the mailman was two hours behind time. He told me that he frequently saw Owls when travelling there at night. When Mr. Higham and I visited Augusta in April 1919, we failed to see any Owls, although we went out along this road several times after dark on purpose to obtain specimens. There were no forest fires there on this occasion. Referring to my remarks in 'Emu,' vol. iii. p. 35, respecting some large unidentified Owl that occurs in the ranges of the North-West Cape peninsula, I had corroborative evidence on my trip there in 1916, when I was camped close to the foot of the ranges on 28 July with two black fellows sleeping a short distance from me. I was roused from my sleep by weird cries that resembled the howling of dingoes (wild dogs). After listening for a few moments, I heard the blacks excitedly talking, and I called to them to ask if the dingoes were crying. They at once replied : "Nothing dingo, that fellow debbil (devil) bird." When I was staying at Mr. Campbell's station a few miles off, shortly afterwards, he asked me if I knew what sort of bird it was "that howls at night just like a dingo." He said that he had heard the noise on several occasions, but had never seen the bird.

Glossopsitta porphyrocephala whitlocki.

Western Purple-crowned Lorikeets were exceptionally scarce about Broome Hill in March 1919, owing to the absence of blossoms on the white-gum trees, the honey of which and other varieties of Eucalyptus is their favourite food. The only district where they were common that year was around Augusta, where the red-gum trees were in full bloom. These Lorikeets do not occur as far north as Carnarvon.

Calyptorhynchus magnificus naso.

Red-tailed Cockatoos were very abundant about Lake Muir in January 1916, so much so that when shooting for food I sometimes shot them for this purpose, as they are easily obtained, but there is not much meat on them. They feed largely on the seeds contained in the extremely hard "nuts" of the red gum, and betray their presence at a long distance by their constant querulous cries. A few small flocks were seen in 1919 about Lake Muir and the Blackwood, Collie, and Warren Rivers, but this fine species has much diminished in numbers during my experience. The aboriginal name in the Harvey River district is "Korridg-e-cup"—hence the name of a township there. Further south, towards Albany, it is "Koo-rak."

Zanda baudinii.

The White-tailed Black Cockatoo was seen in most of the south-western districts, where the aboriginal name for it is "Oo-lack."

Ducorpsius sanguineus westralensis.

When I arrived at Carnarvon early in August 1911, my attention was at once attracted by thousands of Bare-eyed Cockatoos feeding on open flats right up to the outskirts of the town. In places the ground was literally white with the birds, which were busily engaged in cracking off the sharp-pointed hard husks of the "Double-gee" seeds (*Emex australis*) and eating the seeds. When watching the birds doing this, it was very curious to hear the constant "crackling" noise caused by hundreds of bills all hard at work at the same time. The plant itself is not a native of Australia, but is supposed to have been introduced from South Africa. It is now classed as a noxious weed, as it is rapidly spreading over large areas of country, and is responsible for laming many sheep and cattle, as the seed-vessels get in between the divisions of the hoof, causing festering sores, so that the unfortunate animals cannot move about to feed. The local Roads Board had recently passed a bye-law to protect the Cockatoos on account of the supposed good they were doing in eating the seeds, and I was warned not to shoot any of them. However, I believe in the theory that "what eats seeds, spreads seeds," so I shot two birds, and on dissection of them found, as I had expected, that many seeds were swallowed whole and not bitten up; therefore it is probable that some are voided intact and in a fit state for germinating. I explained this to the Chairman of the Roads Board, showing him entire seeds taken from a bird, but he ridiculed the idea of their growing; however, when I saw him again in 1913, he said that he had altered his opinion, and the law had been repealed. When at the Minilya River in early September 1911 these birds had young or eggs in most of the white-gum trees that held suitable nesting hollows, and when I was there again at the same time (1 to 10 September) in 1916 the same state of affairs prevailed. A black fellow and I climbed to many "nests," and they all contained young birds or incubated eggs. On 22 August, 1916, I saw a flock of about two hundred of these Cockatoos at the Yardie Creek, where they breed in the crevices of the cliffs. When staying with a friend near Perth early in that year, he told me that one of these birds which he had kept as a pet for nine years had recently laid an egg in its cage, over which it brooded and made a great fuss.

Licmetis tenuirostris pastinator.

A few Western Corellas were seen at Lake Muir in January 1916, and I shot a pair from a tall yate-tree (*Eucalyptus cornuta*). Both of them had many grains of wheat in their crops, mixed with honey obtained from Eucalyptus blossoms. None were seen at Lake Muir during my visit there in March 1919. When staying at Augusta in March 1916, I saw a flock of five or six flying above the river. The residents there told me these birds are not commonly observed.

Eolophus roseicapillus assimilis.

When I was at the Minilya on 19 August, 1911, the Westralian Galahs did not appear to be breeding (a drought was prevailing at the time), but every day scores of them were drinking at the water-trough for horses etc., close to the homestead and other buildings. They were very tame and made a pretty sight. From 1–10 September, 1916, they were breeding freely at the Minilya, and all the nesting-sites examined contained small young birds.

Leptolophus hollandicus.

Quarrions were scarce in the Gascoyne and Minilya districts in September 1911, but in the same month in 1916 they were abundant there, and about 10 September many nesting cavities near the Minilya River were examined, which all contained young birds in various stages of growth. The small ones were covered with down of a dull *yellow* colour, very similar to that of a white duckling of corresponding age.

Platycercus icterotis.

Yellow-cheeked Parrots were quite scarce when I was at Broome Hill and the vicinity in February and March 1919. In former years they were abundant there and in most localities in the south-west area, but although I traversed a great part of it, I do not think that a dozen of these birds were observed. A very beautifully-plumaged male was obtained on the Warren River on 31 March that appeared to be smaller than those occurring about Broome Hill. I do not think that this species occurs as far north as Geraldton, and when I was staying at Mullewa and Mingenow in 1904 none were observed, while Milligan does not mention the bird as being seen on his trip to Yandanooka in the same year through the same district. I do not think that female birds assume the brilliant colouring of the males.

Barnardius zonarius.

"Twenty-eight" Parrots obtained on the Blackwood River, near Bridgetown, 17 February, 1916, had distinct yellow ventral bands, and those examined at Collie a few days afterwards had only slightly yellow bands. These Parrots were not often seen in the south-west in 1919, owing to the exceptionally severe bush fires in all districts. They were plentiful near Woolundra in May 1919, and those obtained there resemble the subspecies *occidentalis* more than the south-western form. The south-western aboriginal name is "Towerrin." Mr. Mathews described the Woolundra bird as *Barnardius zonarius woolundra* subsp. nov., Bulletin B. O. C. vol. xl. 1920, p. 44.

Barnardius zonarius occidentalis.

Northern "Twenty-eight" Parrots were seldom noticed about the Gascoyne River near Carnarvon in September 1911, but very fairly plentiful in September 1913, and were then rearing their young. A few were seen there in September 1916, and a good many in the ranges north of the Yardie Creek in July and August, but they did not appear to be breeding. The aboriginal name there is "Mullin-goora."

Purpureicephalus spurius carteri.

Red-capped Parrots were very numerous at Collie in February 1916, and were destroying a lot of fruit in the orchards, where they are locally known as "Hook-bills." Only two specimens were obtained on my 1919 trip, when they were very seldom seen—viz., two at Gnowangerup (east of Broome Hill), two on the high road when I was motoring near Brunswick, and one at Lake Muir. (I was keeping an especial look-out for this species, as I wanted specimens.) I do not think that the females of this species assume the rich colouring of the male birds, and immature males are rather brighter in colour than the females. The same applies to *Platycercus icterotis.*

Psephotus varius exsul.

A pair of Western Varied Parrots were shot on 2 September, 1916, in some thick scrub near the Minilya River. I had not seen any of these beautiful birds since 1887, when they were common on the Gascoyne River.

On 23 May, 1919, when I was staying with my friend, Mr. Bruce W. Leake, who is a keen field-naturalist, he told me of having seen some small Parrots near the salt lakes at Woolundra that were strange to him, so we drove out to investigate, and found them to be of this subspecies. There were a good many of them in small parties of three to seven, but they were very wary and shy. However, three specimens were obtained, which had their crops full of wheat grains bitten into small pieces, with many small grass seeds.

Neonanodes elegans carteri.

Allied Grass-Parrots were very scarce in February and March 1919 about Broome Hill, where they were fairly common in previous years. The only examples seen on this trip were a few perched on the telegraph-wires alongside the Gnowangerup road on 18 February, from which place I was returning to Broome Hill by motor mail. I walked out, a day or two afterwards, to the spot where I had seen them, but could not find any.

Neonanodes petrophilus petrophilus.

Western Rock-Parrots seem to be getting rapidly scarcer along the south-west coasts. None were seen in the vicinity of Cape Mentelle in March 1916, and only one was observed at Cape Leeuwin in April 1919, but some of the lighthouse employees there told me that sometimes these birds were fairly common there. They were numerous in parts of Shark Bay during my visit there in 1916.

Melopsittacus undulatus.

Very few Betcherrygars were seen about the mid-west districts in 1911, but they were plentiful in 1916, which was a year of good rains.

Podargus strigoides brachypterus.

Only a few Western Frogmouths were seen in the course of my four trips, and they were mostly in the vicinity of Broome Hill, and usually disturbed from sleeping on the ground in the dense Mà-lock scrubs.

Ægotheles cristata cristata.

No specimens of Owlet-Nightjars were obtained or seen, but they were heard in many localities in the south-west area, mostly about Broome Hill and Gnowangerup.

Dacelo gigas.

Brown Kingfishers, originally acclimatized in Western Australia, are now spread over all the south-west area, and were seen in most districts that I visited, including the Lower Warren River in the extreme corner. They were particularly numerous about the Vasse River in April 1919.

A lady who resided on the bank of the river called my attention to a Brown Kingfisher that was perched on a tree on the opposite side of the river to her house, and expressed a hope that no one would shoot it, because it came there every day and she liked to hear its cackling laugh. Then she showed me, with great pride, some hen-coops with several broods of young chickens and ducks placed on the edge of the river (near where the Jackass was perched at the time), and remarked that all the young birds were growing well, but that one or two unaccountably disappeared almost daily. I told her that, in my opinion, the Jackass came there on purpose to eat them, which she would not believe, but said she would watch it next morning. The next time I met her she said she had seen the bird take a young chicken the day after our conversation.

Dacelo leachii cliftoni.

Pale Fawn-breasted Kingfishers were common about the Lower Gascoyne and Minilya river-beds in September 1911, 1913, and 1916. I climbed to a nesting cavity in a white-gum tree which contained four eggs on 1 August, 1911, but a large Lace-Lizard or Monitor (*Varanus*) took them shortly afterwards. Fledged young birds were seen on the Minilya River on 9 September, 1911.

Cyanalcyon pyrrhopygius obscurus.

On 2 October, 1913, I took five incubated eggs of the Northern Red-backed Kingfisher from a hole in a steep sandy bank of the Gascoyne River. As the eggs were in a distinct nest of fine grass, weeds, etc., it is probable that it had been originally made by a pair of Black and White Swallows (*Cheramoeca*), several of which birds were breeding in the vicinity. On 4 August, 1916, I observed a pair of these Kingfishers breeding in a large white anthill at Yardie Creek.

Sauropatis sancta westralasiana.

Only one Western Sacred Kingfisher was seen in the mid-north-west, and that was shot at the mouth of the Yardie Creek on 29 August, 1913, as it looked unusually large. It was a male and measured 230 mm. total length. These birds are scarce in the mid-west area, where *pyrrhopygius* is common. *S. sancta* is the common Kingfisher of the south-west, where it was frequently observed in many localities.

Cosmærops ornatus shortridgei.

Many Western Bee-eaters were seen feeding on the rugged ranges at the Yardie Creek on 29 August, 1913, but I could not find out what insect had attracted them there. These birds seem migratory to some extent, as they are common about Carnarvon and the mid-west in the winter months, and are rarely seen in the south at that season. The reverse of this occurs in the summer.

Heteroscenes pallidus occidentalis.

Western Pallid Cuckoos were scarce in mid-west districts in 1911, owing to its being a dry season, but were plentiful in August and September in 1913 and 1916. None were seen by me in 1919 (when I only visited the south-west area) from the beginning of February to the end of April, when these birds are usually absent. I wonder what becomes of these Cuckoos from, say, November to May, when they are practically absent from both the mid-west and south-west areas. I have records of having seen occasional single birds in December about Broome Hill and Albany, and a few at Lake Muir on 20 January, 1916; but none were ever observed in February or March, and only once was one recorded for April during nine years' observation and residence in that district. These Cuckoos usually arrive in the Gascoyne and mid-west districts about May, or with the first winter rains, and remain until about September; this period coincides very nearly with the months in which they were common about Broome Hill, which were from about the end of May to the end of October.

Cacomantis rubricatus albani.

Western Fan-tailed Cuckoos were only seen on the Warren River in March 1919. Specimens were obtained there.

Owenavis osculans rogersi.

I shot a Western Black-eared Cuckoo on 6 June, 1916, on the edge of a mangrove creek at Carnarvon. It was perched on the topmost twig of a mangrove, and was uttering a peculiar whistling cry, which was hard to locate. Another of these birds was first heard, and then seen, in some scrub on a flat near the river. On 13 September, in the same year, I shot a second specimen about forty miles south of the Minilya River. Previous to the above, I had only seen two of these birds during thirty years' residence in Western Australia.

Neochalcites basalis wyndhami.

Western Narrow-billed Bronze Cuckoos were seldom observed in the mid-west in the dry year of 1911, but were fairly common from Carnarvon northwards in August and September 1913 and 1916, as is usual in a good season. Two specimens were obtained by me on Dirk Hartog Island in September and October 1916 respectively, and I here beg to express my regret for having inadvertently called them *Lamprococcyx plagosus* in my paper in 'The Ibis,' 1917, p. 584, which error on my part has been already corrected in 'The Ibis,' January 1919.

Lamprococcyx plagosus carteri.

Many small parties of Western Bronze Cuckoos were seen by me on and about 4 March, 1916, on the edge of the Margaret River. Such unusual numbers suggested a local migration. An immature bird was seen at Lake Muir on 24 January, 1916. A male bird, not breeding, was shot by me at Carnarvon on 15 August, 1911. This is the only specimen that I ever obtained in mid-west district.

[To be continued.]

XXVI.—*On a Doubling of the Central Tail-feathers in a Bird-of-Paradise.* By Dr. J. A. BIERENS DE HAAN (Amsterdam).

(Text-figures 1 & 2.)

HALF a century ago Von Rosenberg wrote in the Nat. Tijdschr. voor Ned. Indië, xxix. 1867, that as a rare exception males of *Paradisea apoda* were found with three, instead of two, wiry median rectrices. Such males would be called "Radjahs" or Kings of the Paradise-Birds by the natives of the Aru Islands. Rosenberg succeeded in capturing such a specimen. It was sent to Leyden, and afterwards described by Schlegel (in the 'Muséum d'Hist. nat. des Pays-Bas,' 1867) as a "variété très curieuse."

However, the matter did not attract much attention. Neither Elliot nor Sharpe mentioned it in their Monographs on the Birds-of-Paradise; Salvadori alone refers to it in his 'Ornithologia della Papuasia' (1881), but remarks that he cannot suppress the suspicion "che si tratti di cosa artificiale."

In the Zoological collections of the "Handelsmuseum van het Koloniaal Instituut" at Amsterdam (the former Colonial Museum at Haarlem) I found a mounted male specimen of the small Bird of-Paradise (*P. minor*) that showed an abnormality of the same kind. The tail, that has normally 12 feathers, here had 14, of which 4, instead of the normal 2, were produced into the well-known thread-feathers. That the case was not an artificial one was clearly visible on a more exact examination of the insertion of those feathers. In fig. 1 the normal insertion of the tail-feathers is shown after removing the coverts. The ten normal rectrices (*r*) appear on the same level on both sides; the two central thread-feathers (*r'*) with their white shafts arise on a higher level from a knob (*k*), and are surrounded for a short distance by a kind of horny cover (*h*) as a continuation of that knob. In fig. 2 the insertion in the abnormal case is shown. The knob (*k'*), from which the four wiry feathers arise, is here twice as broad as in the normal case (resp. 5 and 10 mm.). The outer thread-feathers (*r''*) therefrom partially cover the inner normal rectrices. Only the inner thread-feathers are surrounded by the horny cover (*h*); the shafts of the outer ones are less white, and nearer to their base they are provided with small webs. The outer two thread-feathers are a little shorter than normal (viz. 48 cm.), the inner ones are of normal length (50 cm.). It therefore seems clear that the outer are to be looked upon as the supernumerary ones.

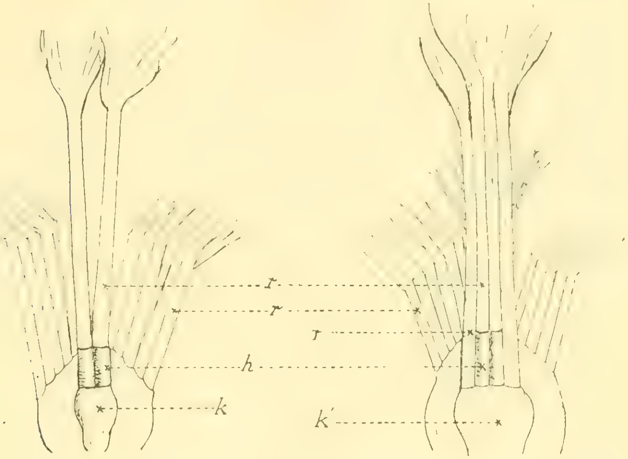


Fig I *Fig 2*

Fig. 1. Insertion of the tail-feathers in a normal case (somewhat diagrammatic).
r, normal tail-feathers; *r'*, thread-feathers; *k*, knob from which thread-feathers arise; *h*, horny cover of thread-feathers.

Fig. 2. Insertion in the abnormal case.
r', normal thread-feathers; *r''*, supernumerary ones; *k'*, enlarged knob.

Dr. Van Oort was so kind as to show me the Leyden specimen mentioned above. Here there was only one supernumerary feather, and this seemed to arise out of the same cover as one of the two normal. Perhaps there is some reason for scepticism about the naturalness of the origin in this case.

How is such an abnormality to be explained? We do not gain very much by using the word "atavism" (although we could mention birds with more than twelve tail-feathers), because undoubtedly the thread form of the inner feathers is a character newly acquired in the family Paradiseidæ. Of course we do not know whether the abnormality is hereditary (as, for instance, polydactyly). It might be supposed that the enlarged number of thread-feathers was only the result of an abnormal or incomplete moulting, and therefore an accidental and individual deviation. The insertion of the feathers in the doubled knob, however, make, as it seems to me, this hypothesis highly improbable. The case is somewhat more complicated by the symmetry of the doubling and the inequality of the normal and supernumerary thread-feathers on each side. Like other authors on this subject, I am of the opinion that in similar cases of doubling, not easily explained by external influences, we recall the vegetative mode of division, so largely spread in lower animals, revived, perhaps, after a damage at an embryonic stage. Regarding the question, whether such a vegetative augmentation of the number of rectrices be not a very rare exception, we must keep in mind that with birds with equal tail-feathers such an abnormal increase will not often be detected.

In reference to the above paper, Lord Rothschild wishes to remark that the duplication of the central pair of rectrices in the Paradiseidæ is not so rare as supposed. Besides several previous records in the literature from various sources, he wishes to say that the Tring Museum possesses a skin of *Diphyllodes magnifica* with four fully-developed central rectrices.

XXVII.—*Obituary.*

Mr. F. W. Headley.

Frederick Webb Headley, who died on the 25th of November last, after an operation, was the second son of the late Rev. Henry Headley of Brinsop Vicarage, Herefordshire, and was born on the 10th of April, 1856. He made a great study of birds from his earliest childhood, and at the age of five fell from a tree while after a bird's nest and had a marvellous escape. He was educated at Harrow School, and Gonville and Caius College, Cambridge. His school career was brilliant, and he gained a first class in the Classical tripos in the year 1878.

He went to Haileybury College as Assistant-Master in 1880 and remained there until last July. He was a man of many parts, and in spite of his classical education, taught on the modern side most of his career, but latterly on the classical side. He also inaugurated and managed the Biological Museum at Haileybury, which was a great success.

Just before his operation he spent a month at Bardsey Lighthouse, and made copious notes on birds migrating.

His great ambition was to go round the world, and he would have started on the trip last August had he been able to secure a passage. His energy was surprising, and he maintained it to the end.

Mr. Headley was elected a member of our Union in 1905, and continued so until his death. He wrote a distinctly important work called 'Flight of Birds,' besides 'Life and Structure of Birds,' 'Life and Evolution,' 'Darwinism and Socialism,' and various shorter articles.

N. A. Sarudny.

We learn from Major F. M. Bailey, of the Indian Political Service, who has recently been in Russian Turkestan, of the death of the well-known Russian Ornithologist, Dr. N. A. Sarudny, or as it is sometimes spelt Zarudnij. This occurred in March 1919 at Tashkent in Turkestan, and was hastened by privations endured under the Bolshevist regime.

Dr. Sarudny was for many years Curator of the Museum in Tashkent, and had travelled very extensively, not only in Turkestan but also in Persia and Baluchistan. He was not only a very careful field-naturalist and collector, but had published much on the Birds of Central Asia in the 'Messager Ornithologique' and other Russian journals. Major Bailey describes how he found him and his wife living in one room of his house, all the others having been taken from him by the Bolshevists. In this one room was his private collection of birds, stored in cardboard boxes and filling nearly the whole space up to the ceiling. This valuable collection was "nationalized" by the Bolshevists at the time of his death, and is now in the Museum at Tashkent.

XXVIII.—*Notices of recent Ornithological Publications.*

Brook on the Common Buzzard.

[The Buzzard at Home. By Arthur Brook. London: 1920. 8vo. Pp. 1–15; 12 photographic illustrations.]

This is another of the sketches of Bird-Life, published by Messrs. Witherby, corresponding to that of the Golden Eagle (Ibis, 1910, p. 207). The writer set up a tent close to a Buzzard's nest in Wales, and was able to secure pictures of the adult and young on various occasions. He gives an interesting account of what he saw during the period that the young were in the nest and of their subsequent flight from it. Incidentally he tells us that he has known of more than one nest on the ground in heather or rushes.

Gladstone on Jardine's Calendar.

[A Naturalist's Calendar, kept by Sir W. Jardine from 1 January to 31 May, 1829. (Reprinted from Trans. Dumfr. N. H. Soc., Feb. 1919.)]

A Calendar, kept for a few months of one year, can never, of course, be of any great importance; but we should like to draw attention to Mr. Gladstone's transcription of, and notes on, the manuscript of a great naturalist of the last century, as it shows the status and abundance of birds on the West Marches of the Borderland in 1829, compared with the present day.

Gurney on the Black-headed Gull.

[Breeding Stations of the Black-headed Gull in the British Isles. By Robert Gurney. (Extract from Trans. Norf. & Norw. Nat. Soc. x. 1918–19, pp. 416–447.)]

It is especially fitting that this article should be written by a resident in Norfolk, where the well-known "Gullery" at Scoulton is situated—no doubt the largest in existence in our islands; while Mr. Gurney has been most successful in gathering records and obtaining full information. Probably he has passed over a few cases where the birds have bred in small numbers for a single season; but this is, we suppose, intentional, though we think that in an area with which we are well acquainted on the Borders, he should have noted the temporary change of quarters of the Pallinsburn colony to the neighbouring Paston Loch.

Mullens, Swann, and Jourdain on Bibliography of Birds.

[A Geographical Bibliography of British Ornithology from the earliest times to the end of 1918. By W. H. Mullens, H. Kirke Swann, and Rev. F. C. R. Jourdain. Part 3. London: 1920.]

A third part of this work, which concludes the County of Middlesex and reaches as far as Surrey, is especially important to residents in the Metropolis. We congratulate the joint authors on the fullness of the information given, which seems to leave little to be desired, and feel sure of the great utility of the result of their labours.

Swann on the Birds-of-Prey.

[A Synoptical List of the Accipitres (Diurnal Birds of Prey). By H. Kirke Swann. Part iv. (conclusion). London: 1920.]

This part comprises the *Falconinæ* and *Pandiones*, with an Index to the Genera in the work. One new subspecies (*guatemalensis*) is proposed under *Cerchneis sparveria*, and for some recondite reason *Tinnunculus* is changed to *Tinnuncula*. The word is a substantive, and can have no feminine.

Wait on Ceylon Birds.

[The distribution of birds in Ceylon and its relation to recent geological changes in the Island. By W. E. Wait. Spolia Zeylanica, x. pt. 36, pp. 1–32, 1914.]

[Notes on Ceylon Rails, Waders, Gulls, and Terns. Id., ibid. pt. 38, pp. 179–265, 1916.]

[Notes on Ceylon Water-Birds, Ceylon Pigeons, and Game-Birds. Id., ibid. pt. 39, pp. 287–379, 1917.]

Since the publication of the late Colonel Legge's fine volume on the Birds of Ceylon about forty years ago, but little has been added to our knowledge of the avifauna of that island. In the last few years, however, Mr. W. E. Wait, of the Ceylon Civil Service and a member of our Union, has been devoting a good deal of attention to this matter, and is now engaged in preparing a handbook on the subject which will supplement and revise on more modern lines Legge's great work; this is out of print and was always a most difficult and expensive book to procure.

In the meantime, before issuing the complete work, Mr. Wait published in 'Spolia Zeylanica,' the organ of the Colombo Museum, two parts of his notes dealing with the water- and game-birds, and these will undoubtedly be of great assistance to all those in Ceylon who are interested in birds. Keys and descriptions of each species are given, together with notes on the distribution and habits, special attention being given to the nests and eggs, of which last Mr. Wait has a very fine and complete collection.

In matters of nomenclature and classification Blanford and Oates's volumes on the Birds in the 'Fauna of British India' are followed, while references are given to Legge's work; but we hope that when the handbook is completed a more modern system of nomenclature will be used, as only by this means will the differentiation of the Ceylonese fauna—which is very considerable, considering the small extent and shallow nature of the sea separating Ceylon from India—in the matter of subspecies, apart from the quite distinct generic and specific forms, be made manifest. This subspecific variation was, of course, to a large extent ignored by the older writers.

The first paper listed above contains a discussion of the zoo-geographical relations of the Ceylonese avifauna, and is in the form of a criticism of Dr. Blanford's well-known paper on the "Distribution of Vertebrate Animals in India, Burma, and Ceylon," published in the Philosophical Transactions of the Royal Society in 1901. After a review of the more characteristic forms, Mr. Wait draws attention to the fact that there are two very distinct elements in the avifauna of Ceylon. The oldest, as is shown by the far greater amount of differentiation, inhabits the central Kandyan uplands and the damp low country to the west of the mountains to the neighbourhood of Colombo; this fauna is closely related to that of the Malabar district of south-western India, where very similar conditions prevail, and it is here that nearly all the types confined to Ceylon are found.

The dry north-east and north-west coastal districts have an avifauna largely identical with that of the eastern portion of the Madras Presidency, which may be termed the Carnatic tract. Mr. Wait finds that these two regions possess several genera and species not found in the Malabar or Kandyan regions, and that there is little or no specific or subspecific differentiation in this case, showing that migration into Ceylon is much more recent, geologically speaking, than in the case of the Malabar-Kandyan connexion. Mr. Wait discusses the geological and climatic changes which appear to have been necessary to bring about these results, and seems to have made out a good case for the ultimate firm establishment of his hypotheses.

Austral Avian Record.

[The Austral Avian Record. Vol. iii. Nos. 7, 8. Editor, Gregory M. Mathews. London: Dec. 1919, Feb. 1920.]

The second of these numbers contains only the Title Page, Table of Contents, and Index to the third volume; but the first consists of an account of the life and work of three living Australian Ornithologists—S. A. White, T. Carter, and W. D. K. Macgillivray. To the first, himself the son of the well-known Zoologist of Gould's time, we owe the greater part of our knowledge of the birds of Central Australia, as well as much information concerning those of the North; the second is equally noted for his work in the West, and has contributed several papers to 'The Ibis' from 1886 up to this year; the third is of the same clan as the noted author of the 'History of British Birds,' and is still as energetic as ever in the pursuit of science. All are responsible for the discovery of new forms, or the rediscovery of old; and, what is almost more important in Australia, have added immensely to our knowledge of the life-histories of the rarer species. Their writings are such as must be read, marked, learnt, and inwardly digested.

Canadian Naturalist.

[The Canadian Field Naturalist. Vol. xxxiii. Nos. 4–6. Ottawa: 1919–1920.]

These parts contain popular articles on Bird-study, Bird-collecting under permits, and a good paper by Mr. Fleming on the Ornithology of Saskatchewan and Manitoba, which was also published in the last number of 'The Ibis,' by agreement with the editor. Moreover, Mr. Oberholser names a new Swallow from Western Canada, *Petrochelidon albifrons hypopolia*, and discusses the distribution of the races of the species involved.

Journal of the Natural History Society of Siam.

[The Journal of the Natural History Society of Siam. Vol. iii. Nos. 1–3, Nov. 1918–Aug. 1919.]

In the first two numbers Mr. W. J. F. Williamson writes on important bird-records from Siam, and on the breeding of certain Terns (*Sterna bergii*, *S. melanauchen*, and *S. anæstheta*). The bird-records are nearly all of forms which are new to the country or have been lost sight of, but the details of distribution must be left to our readers to study.

A more important article is that by Messrs. Robinson and Kloss on a collection made by them at Puket Island off peninsular Siam, to be compared with Count Gyldenstolpe's "List," which we are now publishing. In spite of the efforts of former collectors the authors are able to separate three new races (*Cyanops mystacophanes aurantiifrons*, *Mesobucco duvauceli stuarti*, and *Chloropsis cyanopogon septentrionalis*), and add two species of *Pericrocotus* to the list of birds occurring in the Peninsula. They were struck by the numbers of *Baza lophotes* seen, and obtained one example of the rare *Monticola gularis*.

In the third number Mr. Stuart-Baker gives a long account of a very noteworthy collection of birds formed by Mr. E. G. Herbert in Siam, and presented to the British Museum; here we should like to call attention to the large number of Siamese forms which are now relegated from specific to subspecific value, besides the new races also in considerable numbers. Everyone interested in the fauna of the Oriental Region should study this paper, which is to a certain extent a summary of Siamese Ornithology, though in the form of an annotated list, and no one should fail to read the comparatively new journal in which it is contained.

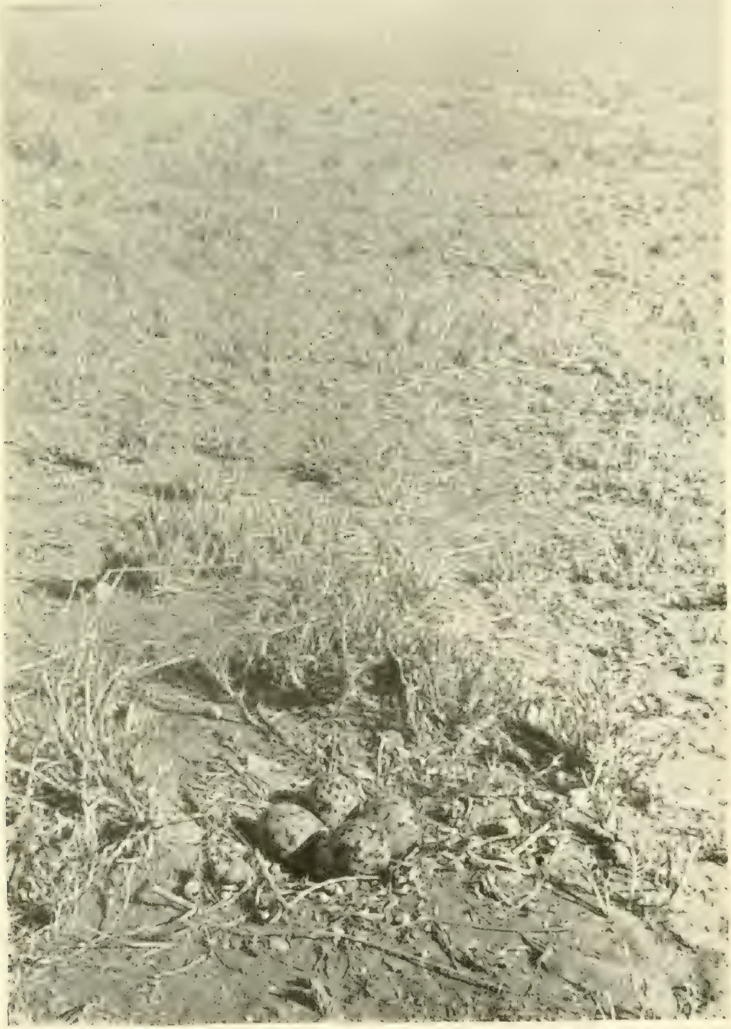
The Emu.

[The Emu. Official organ of the Royal Australasian Ornithologists' Union. Vol. xix. pts. 1-3. Melbourne: July 1919-Jan. 1920.]

The first part contains articles on the Upper Clarence Region, N. S. W., by Mr. Ramsay; the Mackay district by Messrs. Harvey; the Dolomite country by Mr. Kersey; and the Upper Murray River by Colonel Bryant; while these distributional papers are intermingled with others on separate species. Here Mr. A. T. Campbell writes on some Wren-Warblers, with a coloured plate of the forms from Dirk Hartog and Barrow Islands and the mainland; Mr. Gilbert on the Black-throated Honey-eater; Mr. McGilp on the nest and eggs of the Desert Bush-Chat; Mr. Alexander and Mr. Chisholm respectively on four Western Australian species and on those introduced into Queensland. A note on a Dipterous Bird-Parasite is of considerable interest; while we wish to call special attention to the article entitled "An Ornithologist with the A.I.F. in Egypt and Palestine," by Mr. Berney, who served there during the war.

In the second part Mr. Hall compares the Eastern Palæarctic and Australian Avifauna, as observed in his journey to the Lena Delta (Ibis, 1904, p. 415); Mr. Lord gives an account of a trip to the Tasmanian National Park; and Mr. Sutherland writes on birds observed at a New Zealand Lighthouse. Captain White has a coloured plate and discussion on the Allied Buff-rumped Tit-Warbler; Mr. Alexander criticizes Mr. Campbell's Wren-Warbler paper; and various authors write on the food or habits of certain Parrots.

The third part contains an account of the R. A. O. U. Annual Meeting, with articles on the excursions to the Bunya Range and Stradbroke Island. We have also notes on Sea Birds and on northern species by Major Macgillivray and Mr. W. H. D. Le Souef respectively; while under the species separately treated come the Striped-breasted Shrike Thrush (with a coloured plate), and Small-billed Tit-



NEST AND EGGS OF CHETTUSIA LEUCURA.

Warbler (Mr. A. J. Campbell), and the nesting of the White-rumped Swift (Mr. Cochrane). There is also a report on "Bird-ringing," besides the interesting shorter notes always to be found in the pages of our contemporary. Most of the papers have excellent photographic plates.

We have left to the last a paper running through all three parts, and entitled "Material for a Study of the Megapodiidæ," by the well-known Osteologist Dr. Shufeldt. An article from his pen is always worthy of close study; while in this case the wonderful nature of the Megapodes gives special interest to such a full and careful account of them, illustrated both by black and coloured plates.

XXIX.—*Letters, Extracts, and Notes.*

The Nest of a Mesopotamian Plover.

Dear Sir,—The accompanying photograph (Plate XVII.) of a nest and eggs of *Chettusia leucura* (White-tailed Plover or Lapwing) was taken by my son, Capt. W. Edgar Evans, R.A.M.C., near Amara, Mesopotamia, on 29 May, 1918. Many pairs of *C. leucura* were breeding in the neighbourhood of Amara that year, but their nests were by no means easy to find, the natural wariness of the birds, the open character of the country, and the almost tropical heat of the sun combining to defeat his attempts. Regarding the two nests he found and photographed, my son has supplied the following information:—

"The first nest I succeeded in finding was in an irrigated but uncultivated piece of land near the Tigris, two to three miles above Amara. The ground was in parts fairly wet; while the drier portions were much encrusted with white 'salt,' and sparsely covered with suædas and grasses. Here four pairs of White-tailed Lapwings were nesting in 1918. They were extremely demonstrative on my approach, yelping, after the manner of Redshanks, as they flew around or perched on some small eminence. On 17 May, a direct search for the nests having first failed, I returned to the field by creeping along an irrigation ditch and lay-up behind a small fig-tree. The birds were now quiet, and apparently my return had been unobserved. Presently one of the females came into view on my right, and after many spasmodic little runs disappeared behind some tufts of grass and there remained. Feeling sure she must be on the nest, I hastily jumped up, and running towards the spot saw her fly off (she had no time to run as she had without doubt previously done on my approach), but even then I did not at once see the nest, so well did the eggs harmonize with their surroundings. The nest was merely a scrape in the comparatively bare drier ground, with a few dead rough, brown straws in it, chiefly at one side. The eggs were four in number, and not more than four to five days' incubated.

"The second nest, shown on the accompanying plate, was found on 29 May on a dry ridge among the marshes some twelve miles below Amara, and about a mile from the left bank of the Tigris. On the rushy margin of the adjoining marsh many noisy *Chettusias* were flying around, but a search for the nests there came to nothing, and the subsequent finding of the nest on the ridge was purely accidental. It was close to a small straggling leafless *Lycium* bush, and contained four practically fresh eggs. The extent to which this Plover is gregarious in the breeding-season may be gathered from the fact that I have counted as many as twenty-one around me at one time. Considerable numbers of Kentish Plovers (*Ægialitis alexandrina*) were also breeding on the ridges among these marshes. Two nests found by me contained three incubated eggs each."

The eggs of *Chettusia leucura* from the above-mentioned nests agree, on the whole, with the figures given by Dresser in 'The Ibis' for 1902 (Pl. VI. figs. 1 & 2), the ground-colour, however, being of a decidedly greyer tint.

Yours truly,
William Evans.

38 Morningside Park,
Edinburgh.
16 February, 1920.

Birds of Texel.

Dear Sir,—It was with some consternation that I saw in Mr. Ticehurst's "Contribution to the Ornithology of the Island of Texel" (Ibis, April 1920) reference made to a list of the birds of that island that I compiled thirty years ago, in the first year of my stay on Texel. Since then I have been able to rectify it considerably, and I find that the statements regarding the Great Grey Shrike, Goshawk, Wigeon, and Great Black-backed Gull should be withdrawn, as I had been misinformed by the local men of that time.

The latest list of birds breeding on the Wadden Islands is to be found in 'Ardea,' the Journal of the Nederlandsche Ornithologische Vereeniging, November 1908, a translation of Leege's latest list, commented on by Messrs. Daalder, van Pelt Lechner, and myself. Even to that list some additions have to be made, especially for the Texel.

The Common Gull is now a constant, though rare, breeder. The Black-headed Gull has increased considerably in a big breeding colony in Waalenburg, on the property of the "Vereeniging tot Behoud van Natuurmonumenten." In the same locality a colony of Sandwich Terns is flourishing and steadily increasing. The Arctic Tern undoubtedly breeds in great numbers on Texel and also on all the other islands. Montagu's Harrier is a much more common breeder than the Marsh Harrier. The Kestrel has repeatedly been found nesting on the ground. A Kingfisher bred in 1902 near the water-mill in "Het Noorden," and the Swift nests in the larger villages. Both the Tawny Pipit and the Grasshopper-Warbler are fairly common breeders in the dunes, and the Nightingale had a nest in 1913, 1914, and 1915, but has disappeared.

Yours truly,
Jac. P. Thijsse.

Binnenduin,
Bloemendaal,
2 May, 1920.

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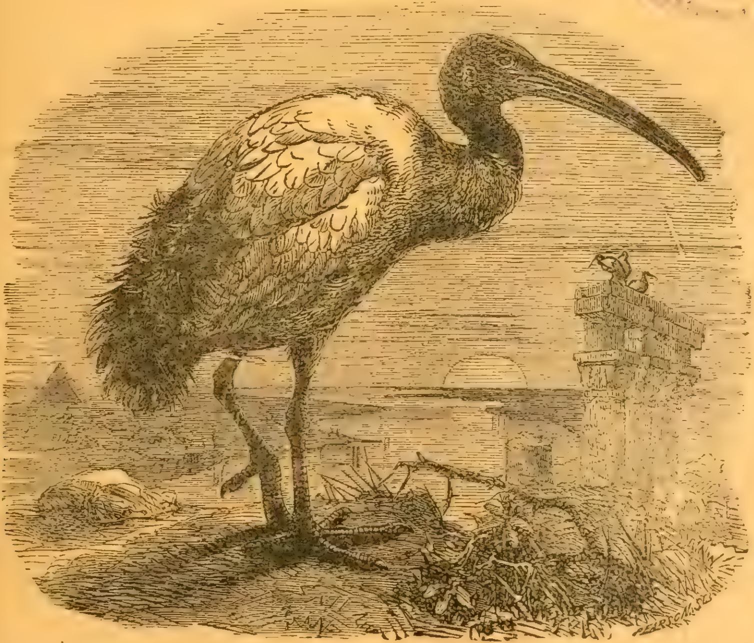

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XXX.—*A Nominal List of the Birds at present known to inhabit Siam.* By Count Nils Gyldenstolpe, D.Sc., F.M.B.O.U.

[Continued from p. 607.]

Family Phasianidæ.

Francolinus chinensis Forster.

Tetrao chinensis Forster, Faunula Sinensis, ii. 1771, p. 326: China.

Occurs throughout Siam, though locally distributed and nowhere common.

Arboricola brunneopectus brunneopectus Tick.

Arboricola brunneopectus Tickell, Journ. Asiat. Soc. Bengal, xxiv. 1855, p. 276: Tenasserim.

A mountain species hitherto only found among the higher mountains of northern and north-western Siam. Specimens recorded from Doi Vieng Par and Sai Yoke.

Arboricola chloropus chloropus Tick.

Tropicoperdix chloropus Tickell, Journ. Asiat. Soc. Bengal, xxviii. 1859, p. 415: Tenasserim.

The Green-legged Hill Partridge is fairly abundant in the northern hill-forests, where specimens have been collected at Bang Hue Hom, Kao Plyng, and Koon Tan. It has also been recorded from Klong Menao in the eastern parts of the country, and Gairdner states that it occurs in the provinces of Ratburi and Petchaburi.

Arboricola chloropus charltoni Eyton.

Perdix charltoni Eyton, Ann. & Mag. Nat. Hist. (1) xvi. 1845, p. 230 : Malacca.

A southern form inhabiting peninsular Siam. Northern limits of range not properly ascertained.

Caloperdix oculea oculea Temm.

Perdix oculea Temminck, Gall. Ind. iii. 1815, p. 732 : Sumatra.

Appears to be very rare, and only found in the southern parts of peninsular Siam, specimens having been collected at Trang and Bandon. Northern limits of range uncertain, but Gairdner states that it occurs in Ratburi and Petchaburi.

Rollulus roulroul Scop.

Phasianus roulroul Scopoli, Del. Floræ et Faunæ Insubr. ii. 1786, p. 93 : Malacca.

Hitherto only recorded from Kao Nawng in the province of Bandon, peninsular Siam. Gairdner mentions it from Ratburi and Petchaburi, S.W. Siam.

Rhizothera longirostris Temm.

Perdix longirostris Temminck, Pig. & Gall. iii. 1815, pp. 323, 721 : N. Sumatra.

Obtained in the southern parts of peninsular Siam by Mr. Herbert's collectors.

Excalfactoria chinensis chinensis Linn.

Tetrao chinensis Linnæus, Syst. Nat. Ed. xii. 1766, p. 277 : Nanking, China.

Distribution imperfectly known. Specimens hitherto only recorded from Bangkok, Bukit Besar, Biserat, Jalor, and from the island of Puket.

Gallus gallus Linn.

Phasianus gallus Linnæus, Syst. Nat. Ed. x. 1758, p. 150: "Habitat in India Orientali."

The Jungle Fowl is generally distributed throughout the whole country.

Polyplectron bicalcaratum Linn.

Pavo bicalcaratum Linnæus, Syst. Nat. Ed. xii. 1766, p. 268: China.

The Grey Peacock-Pheasant occurs in northern Siam, where it appears to be fairly common though seldom obtained. If the Siamese and Burmese birds differ from those from more western areas they will bear the name *Polyplectron bicalcaratum chinquis* Müll.

Polyplectron malaccensis Scop.

Phasianus malaccensis Scopoli, Del. Floræ et Faunæ Insubr. ii. 1786, p. 93: Malacca.

Recorded from the provinces of Ratburi and Petchaburi in S.W. Siam, as well as from the island of Puket.

Lophura diardi Bp.

Euplocomus diardi Bonaparte, Comptes Rendus, xliii. 1856, p. 415: Cochin-Chine (*Schlegel*).

Appears to be distributed throughout the country. Specimens recorded from Lat Bua Kao, Chan Tuck, Pak Jong, Hinlap (E. Siam), from Meh Lem in northern, and from the island of Puket off the western coast of peninsular Siam.

Gennæus lineatus lineatus Vig.

Phasianus lineatus Vigors, Phil. Mag. 1831, p. 147: Burma.

Distribution very uncertain, as only few specimens of the Burmese Silver Pheasant have ever been collected within Siamese territory. However, it has been recorded from the provinces of Ratburi and Petchaburi in south-western Siam. The present author found it rather numerous at Hat Sanuk, near the Tenasserim frontier, in lat. N. 12°.

Gennæus lineatus sharpei Oates.

Gennæus sharpii Oates, Man. Game Birds, i. 1898, p. 357: Dargwin, Burma.

Authentic specimens have hitherto only been collected in the Meh Taw forest, but it may probably be found in northern Siam.

Our knowledge about the occurrence and distribution of the Silver Phesants in Siam is still very meagre, and some other forms most certainly are to be found, especially in the eastern parts and in the hills of the north.

Argusianus argus Linn.

Phasianus argus Linnæus, Syst. Nat. Ed. xii. 1766, p. 272: Malacca.

Confined to the southern parts of peninsular Siam. Northern limits of range not ascertained, but the present author observed an Argus Pheasant in the jungles due west of Koh Lak in S.W. Siam.

Pavo muticus Linn.

Pavo muticus Linnæus, Syst. Nat. Ed. xii. 1766, p. 268: Java.

The Peafowl is generally distributed throughout the country, but on account of its shyness it is seldom shot or met with by the traveller. Its loud sonorous cry is, however, often heard at sunset.

Family Columbidæ.

Crocopus phœnicopterus viridifrons Blyth.

Treron viridifrons Blyth, Journ. Asiat. Soc. Bengal, xiv. pt. 2, 1845, p. 849: Tenasserim.

Sparsely distributed throughout northern Siam, where specimens have been obtained at Meh Taw, Meh Lua, and along the Meh Yome River.

Treron vernans vernans Linn.

Columba vernans Linnæus, Mantiss. Plant. 1771, p. 526: Philippines.

Quite common in peninsular Siam and on the neighbouring islands. Otherwise it has only been recorded from south-eastern Siam, but northwards it extends as far as Bangkok.

Treron bicincta domvilli Swinh.

Osmotreron domvilli Swinhoe, Ibis, 1870, p. 354: Hainan.

Hitherto only recorded from eastern, south-eastern, south-western, and peninsular Siam. It has also been found on Puket and on Koh Mehsan.

Treron pompadora phayrei Blyth.

Osmotreron phayrei Blyth, Journ. Asiat. Soc. Bengal, xxxi. 1862, p. 344 : Assam.

Fairly common in the northern parts of the country. It has also been met with at Meh Taw and, according to Gairdner, in the provinces of Ratburi and Petchaburi.

Treron curvirostra nipalensis Hodgs.

Toria nipalensis Hodgson, Asiat. Res. xix. 1836, p. 164, pl. 9 : Nepal.

The most common of all the Green Fruit Pigeons met with in Siam.

Treron fulvicollis fulvicollis Wagl.

Columba fulvicollis Wagler, Syst. Avium, Columba, 1827, sp. 8 : Java.

In Siam the Cinnamon-headed Green Pigeon appears to be extremely rare, and it has hitherto only been recorded from Puket.

Treron olax olax Temm.

Columba olax Temminck, Planches Col. Nr. 241, 1823 : Sumatra.

Said to occur in Siam, but never obtained by any recent collector, except Herbert.

Butreron capellii Temm.

Columba capellii Temminck, Planches Col. Nr. 143, 1823 : Java.

Authentic specimens of the Large Thick-billed Green

Pigeon have hitherto only been obtained at Lay Song Hong (Trang), at Mabek and Jalor (peninsular Siam), and at Koon Tan in the north. It appears to be very rare.

Sphenocercus apicauda Hodgs.

Treron apicauda Hodgson, Journ. Asiat. Soc. Bengal, xiv. 1845, p. 854 : Darjeeling.

Hitherto only met with in northern Siam, where specimens have been collected at Koon Tan and Bang Hue Pong. Apparently rare.

Sphenocercus pseudo-crocopus Gyld.

Sphenocercus pseudo-crocopus Gyldenstolpe, Ornith. Monatsber. 1916, p. 29 : Bang Hue Pong, N. Siam.

Up to the present time only known from the type specimen.

Geopelia striata Linn.

Columba striata Linnæus, Syst. Nat. Ed. xii. 1766, p. 282 : "India Orientali."

Apparently confined to peninsular Siam, but extending northwards to Bangkok and its neighbourhood. Distribution still uncertain, but specimens have been obtained and recorded from the following localities : Patani, Ban Sai Kau, Puket, Pulu Lontar, and Bangkok.

Muscadivora ænea sylvatica Tick.

Columba sylvatica Tickell, Journ. Asiat. Soc. Bengal, ii. 1833, p. 581 : Borabhum and Dholbhum.

Siam is inhabited by the race described by Tickell on specimens from Borabhum and Dholbhum. This form differs from the typical *Muscadivora œnea œnea* Linn., the type locality of which may be considered as Flores, in having the cheeks and ear-coverts as well as the hind-neck more uniform grey. Apparently distributed throughout the whole country, where it is fairly common. For the use of the genus name *Muscadivora* instead of *Carpophaga, vide* Hartert & Goodson (Novitates Zoologicæ, xxv. 1918, p. 346).

Ducula insignis griseicapilla Wald.

Ducula griseicapilla Walden, Ann. & Mag. Nat. Hist. (4) xvi. 1875, p. 228: Karen Hills.

The Grey-headed Imperial Pigeon appears to be very rare in Siam. Hitherto it has only been recorded from northern, north-western, and south-western Siam.

Myristicivora bicolor Scop.

Columba bicolor Scopoli, Del. Floræ et Faunæ Insubr. ii. 1786, p. 94: New Guinea.

Confined to peninsular Siam, and apparently very rare as specimens have only been collected at Chumpon Bay and on the island of Koh Phai.

Calœnas nicobarica Linn.

Columba nicobarica Linnæus, Syst. Nat. Ed. x. 1758. p. 164: "Habitat in Insula Nicombar prope Pegu."

Recorded from peninsular Siam and also obtained on Pulu Terutau.

Chalcophaps indica indica Linn.

Columba indica Linnæus, Syst. Nat. Ed. x. 1758, p. 164: "Habitat in India Orientali."

Generally distributed throughout the forest-regions of the whole country. Rather abundant, especially in south-western Siam.

Columba livia intermedia Strickl.

Columba intermedia Strickland, Ann. & Mag. Nat. Hist. (1) xiii. 1844, p. 39: India.

Specimens of the Indian Blue Rock-Pigeon have been recorded from several localities in central and south-western Siam, but it is still uncertain if they are genuine wild specimens or only semi-domesticated individuals. Schomburgk records it from "Siam," and it has also been obtained on the island of Puket.

Alsocomus puniceus Tick.

Alsocomus puniceus Tickell, Journ. Asiat. Soc. Bengal, xi. 1842, p. 461: Singbhoom.

Apparently rather rare and confined to south-western and peninsular Siam. Specimens recorded from the following localities: Hue Sai, Koh Lak, Ratburi, Petchaburi, and from the islands of Terutau, Koh Muk, Koh Phra, and Puket.

Streptopelia turtur agricola Tick.

Columba agricola Tickell, Journ. Asiat. Soc. Bengal, ii. 1833, p. 581: Borabhum and Dholbhum.

Hitherto only recorded from Koon Tan in northern Siam, where a few specimens have been collected. This is the bird formerly known under the name *Streptopelia turtur meena* Sykes, but for which Tickell's name must now be used, as shown by Hartert (Novit. Zool. xxiii. 1916, p. 80).

Streptopelia suratensis tigrina Temm.

Columba tigrina Temminck, Pigeons, i. pl. 43, 1808–1811: Java.

Very abundant throughout the whole country. It generally affects open and cultivated land, and is most numerous in the neighbourhood of towns and villages.

Œnopopelia tranquebarica humilis Temm.

Columba humilis Temminck, Planches Col. Nr. 259, 1824: Bengal.

Generally distributed throughout the country, though not so common as the former species, together with which it mostly occurs.

Macropygia tusalia tusalia Hodgs.

Coccyzura tusalia Hodgson, Journ. Asiat. Soc. Bengal, xii. 1843, p. 937: Darjeeling.

Apparently extremely rare in Siam, where authentic specimens have only been obtained at Koon Tan.

Macropygia ruficeps assimilis Hume.

Macropygia assimilis Hume, Stray Feathers, ii. 1874, p. 441: Tenasserim.

Like the former species the Little Malay Cuckoo-Dove appears to be very rare, and it has only been collected at Raheng and at Koon Tan and Muang Wang.

Family VULTURIDÆ.

Otogyps calvus Scop.

Vultur calvus Scopoli, Del. Floræ et Faunæ Insubr. ii. 1786, p. 85 : India.

The Black Vulture is very common in central, south-western, and peninsular Siam.

Pseudogyps bengalensis Gm.

Vultur bengalensis Gmelin, Syst. Nat. i. pt. 1, 1788, p. 245 : Bengal.

The Indian White-backed Vulture is rather abundant throughout the whole country, though it seems to avoid the more densely wooded parts.

Gyps indicus tenuirostris Hodgs.

Gyps tenuirostris Hodgson in Gray, Gen. Birds, i. 1844, p. 6 : Nepal.

Authentic specimens of the Himalayan Long-billed Vulture have only been recorded from Bangkok and Sakerat (E. Siam), but it most probably occurs together with the other species of Vultures, though apparently more rare.

Family FALCONIDÆ.

Spizaëtus cirrhatus limnaëtus Horsf.

Falco limnaëtus Horsfield, Trans. Linn. Soc. Lond. xiii. 1821, p. 138 : Java.

Sparsely distributed throughout Siam. It, however, appears to be more abundant in south-western and peninsular Siam, where it breeds. It generally affects low country, and is seldom met with among the mountains. Specimens recorded from Lamra (Trang), Kampong Jalor, Koh Lak, Nong Kok, Meh Taw, Koon Tan, and Koh Pennan.

Spizaëtus nipalensis nipalensis Hodgs.

Nisaëtus nipalensis Hodgson, Journ. Asiat. Soc. Bengal, v. 1836, p. 229 : Nepal.

Apparently very rare, and hitherto only recorded from Pulu Terutau and from Hue Sai, north-west of Koh Lak, S.W. Siam.

Spizaëtus alboniger Blyth.

Nisaëtus alboniger Blyth, Journ. Asiat. Soc. Bengal, xiv. 1845, p. 173: Malacca.

Occurs in peninsular Siam, though it seems to be fairly rare. It mostly affects hilly districts, and is seldom met with in the low-lying country.

Lophotriorchis kieneri Sparre.

Astur kieneri Sparre, Mag. de Zool. Cl. ii. pl. 35, 1835: E. Himalayas.

An extremely rare bird. In Siam it has hitherto only been obtained by Gairdner, who shot a single specimen in the province of Ratburi.

Aquila clanga Pall.

Aquila clanga Pallas, Zoogr. Rosso-Asiat. i. 1827, p. 351: Russia.

This Eagle, which breeds in several parts of the Palæarctic region and winters in central Asia, India, China, Burma, and Cochin China, has only been obtained on a few occasions within Siamese territory. It mostly affects open, moist ground. Specimens collected at Koh Lak, Klong Pho Tao, and at Bangkok.

Ictinaëtus malayensis Temm.

Falco malayensis Temminck, Planches Col. Nr. 117, 1822: Malay Archipelago.

In Siam this species has only been collected at Chong in Trang, but is stated to occur among the mountains throughout peninsular Siam.

Pernis cristatus Vieill.

Pernis cristatus Vieillot, Tabl. Enc. Méth. Orn. March 1823, p. 1225: Java.

Distribution and occurrence in Siam very unsatisfactorily known. Specimens recorded under the above-mentioned name have been recorded from Koh Lak and Lem Ngop.

Pernis tweedalii Hume.

Pernis tweedalii Hume, Stray Feathers, ix. 1881, p. 446: Malay Peninsula.

This species, if really distinct from the former, occurs throughout peninsular Siam, though apparently very rare.

Machærhamphus alcinus Westerm.

Machærhamphus alcinus Westerman, Bijdr. tot de Dierk. i. 1848, p. 29, pl. 12 : Malacca.

Extremely rare in Siam, where it has only been obtained at Ban Kok Klap in the province of Bandon, peninsular Siam. Trang (abbott

Circaëtus gallicus Gm.

Falco gallicus Gmelin, Syst. Nat. i. pt. 1, 1788, p. 259 : France.

A single specimen was obtained by the present author at Koh Lak in south-western Siam. Otherwise not recorded from Siamese territory.

Spilornis cheela malayensis Swann.

Spilornis cheela malayensis Swann, Syn. List Accipit. iii. 1920, p. 83 : Pahang.

Recorded from peninsular and south-western Siam, though apparently rare.

Spilornis cheela burmanicus Swann.

Spilornis cheela burmanicus Swann, Syn. List Accipit. iii. 1920, p. 81 : Thayetmyo, Burma.

This form of the Crested Serpent-Eagle is rather common throughout the country, and it occurs among the mountains as well as in the low-lying country.

Spilornis cheela pallidus Wald.

Spilornis pallidus Walden, Ibis, 1872, p. 363 : Borneo.

Specimens belonging to this form have been obtained at Ban Kok Klap, peninsular Siam, and on the island of Koh Samui.

Elanus cæruleus cæruleus Desf.

Falco cæruleus Desfontaines, Hist. (Mém.) Acad. Paris, année 1787, p. 503, pl. xv., 1789 : Algeria.

Found in central and south-western Siam during the winter months.

Milvus lineatus Gray.

Haliaetus lineatus Gray in Hardwicke's Illustr. Ind. Zool. i. 1832, p. 1, pl. 18: China.

Rather common in the open plains of central and south-western Siam, where it occurs together with the next species.

Milvus migrans govinda Sykes, P. Z. S. Lond. 1832, pt. ii. p. 81: Deccan.

Very common indeed at Bangkok and its neighbourhood. It has also been recorded from south-western and parts of central Siam.

Accipiter soloënsis Horsf.

Accipiter soloënsis Horsfield, Trans. Linn. Soc. Lond. xiii. 1821, p. 137: Java.

Horsfield's Short-toed Hawk is apparently very rare in Siam, where it has only been obtained at Pak Koh in northern and at Satahip in south-eastern Siam.

Accipiter gularis Temm. & Schleg.

Astur gularis Temminck & Schlegel in Siebold's Fauna Japon., Aves, 1844, p. 5, pl. 2: Japan.

Authentic specimens of this bird have been collected at Klong Yai and Ok Yam in south-eastern and at Pak Koh and Koon Tan in northern Siam.

Accipiter virgatus virgatus Temm.

Falco virgatus Temminck, Planches Col. Nr. 109, 1824: Java.

Rare in Siam, where authentic specimens have been collected in the neighbourhood of Koon Tan in the northern districts.

Accipiter virgatus affinis Gurney.

Accipiter virgatus subsp. *affinis* Gurney, List of Diurnal Birds of Prey, 1884, pp. 39, 168–173: Himalaya.

Within Siamese territory this bird has only been met with on the islands of Koh Kut and Koh Rang, both situated in the Inner Gulf of Siam.

Accipiter nisus subsp. ?

Williamson has recently obtained two subadult females of a Sparrow-Hawk in the vicinity of Bangkok. According to the statement of Mr. H. C. Robinson of the Federated Malay States Museums, they are rather pale for the Himalayan form (*Astur nisus melanoschistus* Hume), and he considers them as probably migrant specimens of some Chinese race, as, for instance, *Astur nisus nisosimilis* Tick. (Journ. Asiat. Soc. Bengal, ii. 1833, p. 571).

Astur trivirgatus rufitinctus McClell.

Spizaëtus rufitinctus McClelland, P. Z. S. Lond. 1839, p. 153 : Assam.

The larger race of the Crested Goshawk is rather rare in Siam, though it seems to occur throughout the whole country, as specimens have been collected in northern as well as in peninsular Siam.

Astur badius poliopsis Hume.

Micronisus poliopsis Hume, Stray Feathers, ii. 1874, p. 325 : N. Pegu.

The Burmese Shikra is quite common throughout Siam, though it seems to avoid the evergreen forests.

Haliastur indus indus Bodd.

Falco indus Boddaert, Tabl. Pl. Enl. p. 25, 1783 : Pondicherry.

The northern typical form of the Brahminy Kite is quite common in suitable localities throughout central and northern Siam. Its southern limits of range are, however, not properly ascertained.

Haliastur indus intermedius Gurney.

Haliastur intermedius Gurney, Ibis, 1865, p. 28 : Java.

Probably an inhabitant of peninsular Siam, where it appears to be not uncommon. Northwards it extends at least as far as Koh Lak, where it has been collected.

Butastur liventer Temm.

Falco liventer Temminck, Planches Col. Nr. 438, 1827 : Java.

Generally though locally distributed throughout the country, where it appears to be fairly rare. Specimens have hitherto been collected at Sakerat in eastern, at Samkok in central, and in the neighbourhood of Koon Tan in northern Siam.

Butastur indicus Gm.

Falco indicus Gmelin, Syst. Nat. i. pt. 1, 1788, p. 264: Java.

Mr. E. Eisenhofer's native collector obtained a single specimen of the Grey-faced Buzzard-Eagle at Koon Tan in northern Siam, and Williamson has recently obtained some other specimens—viz., at Rayong in south-eastern, and at Bangkok in central Siam.

Circus melanoleucus Forster.

Falco melanoleucus Forster, Ind. Zool. 1781, p. 12, pl. ii.: Ceylon.

Rather common in suitable localities throughout northern and central Siam during the winter months.

Circus æruginosus æruginosus Linn.

Falco æruginosus Linnæus, Syst. Nat. Ed. x. 1758, p. 91: Sweden.

Quite common in central and south-western Siam during the winter. It certainly also occurs in suitable localities throughout the whole country, though specimens have only been recorded from Koh Lak, Bangkok, and Puket.

Circus spilonotus Kaup.

Circus spilonotus Kaup, in Jardine's Contr. Orn. for 1850, p. 59: Asia.

The Eastern Marsh-Harrier has only recently been met with in Siam. Williamson obtained some specimens at Bangkok and Tachin in central Siam.

Haliaëtus leucogaster Gm.

Falco leucogaster Gmelin, Syst. Nat. i. pt. 1, 1788, p. 257: New South Wales, Australia.

The White-bellied Sea-Eagle is not uncommon along the coasts of peninsular and south-eastern Siam. It has also been obtained on Koh Samui, Koh Pennan, and Puket.

Falco peregrinus calidus Lath.

Falco calidus Latham, Ind. Orn. i. 1790, p. 41 : India.

A migratory bird to Siam, where it, however, appears to be rather rare. Another race of the Peregrine Falcon (*Falco peregrinus peregrinator* Sundev.) almost certainly migrates to Siam, though no authentic specimens have hitherto been recorded.

Falco severus severus Horsf.

Falco severus Horsfield, Trans. Linn. Soc. Lond. xiii. 1822, p. 135 : Java.

Extremely rare in Siam and neighbouring countries. Hitherto only recorded from Bangkok and Koh Lak.

Cerchneis tinnunculus saturatus Blyth.

Tinnunculus saturatus Blyth, Journ .Asiat. Soc. Bengal, xxviii. 1859, p. 277 : Tenasserim.

This race is smaller and darker than the typical form of the Kestrel. It breeds in India and China, and has only been found in Siam during the winter months. It is not very abundant, and has hitherto only been collected in peninsular, south-western, and central Siam.

Poliohierax insignis Wald.

Poliohierax insignis Walden, P. Z. S. Lond. 1871, p. 627 : Tonghoo, Burma.

Specimens of Feilden's Hawk have been collected in northern, south-eastern, and eastern Siam, where it seems to be widely distributed. It only frequents open forests or scrub country, where it is mostly seen perching on dead trees, now and then darting down to catch insects, on which it chiefly feeds.

Microhierax cærulescens Linn.

Falco cærulescens Linnæus, Syst. Nat. Ed. xii. 1766, p. 125 : India.

The Red-legged Falconet is quite common throughout northern and north-western Siam, where it is mostly seen in the open dry forests. It has also been obtained at Sakerat in eastern Siam, though it appears to be more rare in these districts.

Microhierax fringillarius Drap.

Falco fringillarius Drapiez, Dict. Class. d'Hist. Nat. vi. 1824, p. 412: Sumatra.

A southern form, being fairly common in the southern parts of peninsular Siam. Northern limits of range still not ascertained, but Gairdner has met with it in the provinces of Ratburi and Petchaburi.

Baza lophotes Temm.

Falco lophotes Temminck, Planches Col. Nr. 10, 1823: Pondicherry.

Generally distributed throughout the whole country, though it appears to be local and is nowhere very common. During the non-breeding season it usually assembles in small flocks, and is then not shy.

Baza jerdoni Blyth.

Lophastur jerdoni Blyth, Journ. Asiat. Soc. Bengal, xi. 1842, p. 464: Malacca.

This is an exceedingly rare Cuckoo-Falcon, and only a few specimens have been obtained in the most southern parts of peninsular Siam.

Family Pandionidæ.

Pandion haliaëtus cristatus Vieill.

Buteo cristatus Vieillot, Nouv. Dict. d'Hist. Nat. (nouv. éd.), iv. 1816, p. 481: "Nouvelle Hollande."

The eastern race of the Osprey is quite common in suitable localities during the winter months.

Polioaëtus humilis Müll. & Schleg.

Falco humilis Müller & Schlegel, Verhandl. Natuurl. Gesch. Ned. Indië, Land- en Volkenk. 1839–1844, p. 47: Sumatra.

Specimens of this Fishing-Eagle have hitherto only been collected at Koon Tan in northern Siam and at Bandon in the peninsular parts of the country.

Polioaëtus ichthyaëtus Horsf.

Falco ichthyaëtus Horsfield, Trans. Linn. Soc. Lond. xiii. 1821, p. 136: Java.

This Fishing-Eagle is found in suitable localities throughout the whole country. It is most common on the big swamps of central Siam, but I have also observed it along the larger rivers of northern Siam.

Family STRIGIDÆ.

Ketupa zeylonensis zeylonensis Gm.

Strix zeylonensis Gmelin, Syst. Nat. i. pt. 1, 1788, p. 287 : Ceylon.

Distribution and occurrence in Siam still very imperfectly known. Specimens have, however, been collected at Koon Tan in northern, and at Chong and Ban Kok Klap in peninsular Siam.

Ketupa ketupu Horsf.

Strix ketupu Horsfield, Trans. Linn. Soc. Lond. xiii. 1821, p. 141 : Java.

Apparently a more southern form than the former species. Occurs in peninsular Siam, where specimens have been collected at various localities. It has also been obtained at Ok Yam in south-eastern Siam by Kloss.

Bubo coromandus klossii Rob.

Bubo coromandus klossii Robinson, Journ. Fed. Mal. States Mus. iv. 1911, p. 246 : Gunong Semanggol, N. Perak.

Obtained at Koh Lak in south-western, and said to occur in peninsular Siam.

Huhua orientalis sumatrana Raffl.

Strix sumatrana Raffles, Trans. Linn. Soc. Lond. xiii. 1822, p. 279 : Sumatra.

Stated to be widely distributed throughout peninsular Siam, but rare and difficult to obtain. A single female specimen was collected at Chong (Trang) by Robinson and Kloss during their expedition, 1909–1910.

Huhua nipalensis Hodgs.

Bubo nipalensis Hodgson, Asiat. Res. xix. 1836, p. 172 : Nepal.

Authentic specimens of the Forest Eagle-Owl have only been collected at Koon Tan in northern Siam. Gairdner mentions it from Ratburi and Petchaburi, but no specimens were obtained there, and this record may possibly be referred to the former species.

Asio accipitrinus Pall.

Stryx accipitrina Pallas, Reise Russ. Reichs, i. 1771, p. 455 : Caspian Sea.

The Short-eared Owl has hitherto only been recorded from Bangkok. Whether this Bangkok specimen belongs to the paler race inhabiting western Siberia and migrating to Assam and Japan, it is impossible to state at present, as I have been unable to examine the specimen. The Siberian race ought to be known under the name of *Asio accipitrinus leucopsis* Brehm, and is considerably paler, especially as concerns the colour of the upper parts, which generally are yellowish creamy. The lower parts are almost pure white, instead of buff as in the typical form.

Scops bakkamœna lettia Hodgs.

Scops lettia Hodgson, Asiat. Res. xix. 1836, p. 176 : Nepal.

Not uncommon in northern Siam, where specimens have been collected at Den Chai, Pak Koh, Chum Poo, and Koon Tan.

Scops bakkamœna lempiji Horsf.

Scops lempiji Horsfield, Trans. Linn. Soc. Lond. xiii. 1821, p. 140 : Java.

Replaces the foregoing in south-western and peninsular Siam, extending northwards at least to Bangkok. Also obtained on Koh Mehsan.

Scops malayanus Hay.

Scops malayanus Hay, Madr. Journ. Litt. Sci. xiii. pt. 2, 1845, p. 147 : Malacca.

Recorded from Trang in peninsular Siam as well as from the island of Puket.

Heteroscops vulpes O.-Grant.

Heteroscops vulpes O.-Grant, Bull. Brit. Ornith. Club, xix. 1906, p. 11 : Gunong Tahan.

Hitherto only recorded from Kao Nawng in the province of Bandon, peninsular Siam.

Ninox scutulata burmanica Hume.

Ninox burmanica Hume, Stray Feathers, iv. 1876, p. 285: Pegu.

Probably an inhabitant of northern and central Siam, but distribution still uncertain. Not uncommon.

Ninox scutulata malaccensis Eyton.

Athene malaccensis Eyton, Ann. & Mag. Nat. Hist. (1) xvi. 1845, p. 228: Malacca.

Replaces the foregoing in peninsular Siam, where it appears to be fairly abundant. These Owls are migrating during the winter months, and the distribution of the different subspecies is very imperfectly known.

Syrnium seloputo Horsf.

Strix selo-puto Horsfield, Trans. Linn. Soc. Lond. xiii. 1821, p. 140: Java.

Fairly common in the southern parts of peninsular Siam, specimens having been collected at Chong, Ban Sai Kau, Biserat, Jalor, Bukit Besar, Koh Boi Yai, Patani, and Bandon.

Syrnium newarensis maingayi Hume.

Syrnium maingayi Hume, Stray Feathers, vi. 1878, p. 27: Malacca.

Robinson and Kloss collected a single specimen at Chong, Trang, peninsular Siam. Nothing else is known about its occurrence in the country, except for a specimen collected by Herbert at Tung Song in 1915.

Athene brama pulchra Hume.

Athene pulchra Hume, Stray Feathers, i. 1873, p. 469: Pegu.

Evidently rare and locally distributed. It has been recorded by Herbert as being quite common some 40 miles north of Bangkok.

Glaucidium brodiei Burton.

Noctua brodiei Burton, P. Z. S. Lond. 1835, p. 152: Himalaya.

Probably found in the well-wooded districts of the whole country. Hitherto it has been recorded from Koon Tan and Pah Koh in the north, and from Bandon in peninsular Siam.

Glaucidium cuculoides Gould.

Noctua cuculoides Gould, Cent. Himal. Birds, 1832, pl. 4: Himalaya.

Commonly distributed throughout the whole country.

Strix flammea javanica Gm.

Strix javanica Gmelin, Syst. Nat. i. pt. 1, 1788, p. 295: Java.

Very abundant in Bangkok, but hitherto not found outside the town. Recorded by Gairdner from Petchaburi and Ratburi.

Photodilus badius Horsf.

Strix badia Horsfield, Trans. Linn. Soc. Lond. xiii. 1821, p. 139: Java.

Evidently extremely rare in Siam, where only a single specimen has been obtained by the present author at Koon Tan in the north.

Family Charadriidæ.

Burhinus œdicnemus indicus Salvad.

Œdicnemus indicus Salvadori, Atti Soc. Ital. Sc. Nat. Milano, viii. 1865, p. 380: India.

Quite recently obtained in Siam, where only three specimens have been collected: viz., at Sena Yai, Krung Kao, central Siam, and at Klong Toi, Bangkok, as well as at Hua Hin, S.W. Siam.

Esacus recurvirostris Cuv.

Œdicnemus recurvirostris Cuvier, Règne Anim. ed. 2. i. 1829, p. 500: India.

Only recorded from Siam by Schomburgk (*vide* P. Z. S. Lond. 1859, p. 151).

Glareola maldivarum Forster.

Glareola (Pratincola) maldivarum Forster, Faunula Indica, 1795, p. 11 : Maldive Islands.

This bird was formerly known under the name of *Glareola orientalis* Leach, but according to the laws of priority it must in future bear Forster's name. Within Siamese territory it has only been recorded from Bangkok and Koh Lak.

Glareola lactea Temm.

Glareola lactea Temminck, Man. d'Orn. ed. 2, ii. 1820, p. 503 : Bengal.

Hitherto only recorded by Herbert from Krabin, central Siam.

Sarcogrammus indicus atronuchalis Blyth.

Lobivanellus atronuchalis Blyth, in Jerdon's Birds of India, iii. 1864, p. 648 : Burma.

The Burmese Lapwing is commonly distributed throughout the whole country.

Microsarcops cinereus Blyth.

Pluvianus cinerea Blyth, Journ. Asiat. Soc. Bengal, xi. 1842, p. 587 : Calcutta.

Stated by Gairdner to be not uncommon at Raheng in central Siam, and usually found in company with the Spur-winged Plover. Also obtained at Pak-hai, Krung Kao, central Siam, and at Bangkok.

Arenaria interpres Linn.

Tringa interpres Linnæus, Syst. Nat. Ed. x. 1758, p. 148 : Sweden.

A rare migratory bird to Siam and neighbouring countries. Hitherto only obtained at Jhering in the southern parts of peninsular Siam and on the island of Koh Muk.

Hoplopterus ventralis Wagl.

Charadrius ventralis Wagler, Syst. Avium, Charadrius, 1827, sp. 11, p. 59 : Calcutta.

Generally found along the larger rivers of the whole country.

Squatarola squatarola Linn.

Tringa squatarola Linnæus, Syst. Nat. Ed. x. 1758, p. 149: Sweden.

Apparently rather rare in Siam, where it of course only occurs during the winter months. Specimens have been obtained at Koh Lak, Paknam Chantabun, and on the island of Koh Muk. The eastern birds are stated to be slightly larger throughout and the bill is generally deeper, and on account of that they have been separated under the name of *S. squatarola hypomelas* Pallas (Reise Russ. Reichs, iii. 1776, p. 699: E. Siberia). This race is, however, not valid as a distinct subspecies.

Charadrius dominicus fulvus Gm.

Charadrius fulvus Gmelin, Syst. Nat. i. pt. 2, 1789, p. 687: Tahiti.

A winter visitor to Siam, where it, however, appears to be not common.

Ochthodromus geoffroyi Wagl.

Charadrius geoffroyi Wagler, Syst. Avium, Charadrius, 1827, sp. 19, p. 61: Java.

Winters in Siam, where specimens have been collected at Koh Lak and on the island of Puket.

Ochthodromus mongolus mongolus Pall.

Charadrius mongolus Pallas, Reise Russ. Reichs, iii. 1776, p. 700: Mongolia.

Apparently rare, and hitherto recorded from Patani, Paknam, and Koh Lak. Winter visitor only.

Ochthodromus mongolus pyrrhothorax Gould.

Charadrius pyrrhothorax Gould, Birds of Europe, iv. 1837, p. 299: "Russia."

Specimens belonging to this race, which is only slightly different from the typical form and perhaps not valid as a distinct subspecies, have been recorded from the islands of Koh Pennan, Koh Muk, Puket, and Terutau.

Ægialitis placida Gray.

Charadrius placidus Gray, Cat. Mamm. &c., coll. Hodgson, ed. 2, 1863, p. 70: Nepal.

Very rare, and hitherto only a single specimen has been collected within Siamese territory: viz., at Koon Tan in northern Siam.

Ægialitis alexandrinus dealbatus Swinh.

Ægialitis dealbatus Swinhoe, P. Z. S. London, 1870, p. 138: south coast of China, including Formosa and Hainan.

The eastern race of the Kentish Plover is not rare in Siam during the winter months, and specimens have been recorded from Koh Kram, Koh Lak, Koh Samui, and Koh Pennan.

Ægialitis alexandrinus peroni Schleg.

Charadrius peroni Schlegel, Mus. Pays-Bas, Cursores sp. 33, 1865: Borneo.

Resident in the Malay Peninsula and probably in peninsular Siam, but records very few. Specimens collected at Koh Lak and on Pulu Telibun.

Ægialitis dubia jerdoni Legge.

Ægialitis jerdoni Legge, P. Z. S. Lond. 1880, p. 39: Ceylon and central India.

The specimens collected at Koon Tan in northern Siam by the present author belong to the above-mentioned race. The Little Ringed Plover is, however, quite common in suitable localities during the winter-time, but as it has always been recorded under the name of *Ægialitis dubia* only, and being not differentiated subspecifically, it is uncertain if it belongs to the race described by Legge or to the typical form, *Ægialitis dubia dubia* Scop., founded on specimens from Luzon in the Philippine Islands. According to Hartert and Jackson, this form "breeds and is resident on the Philippine Islands, in Hainan, Formosa, and apparently parts of south China, and occurs sometimes on the Japanese Islands." The wings of *A. dubia jerdoni* Legge measure from 103–112 and even 114 or 115 mm., while the wings of *A. dubia dubia* Scop. measure 109–116 and even 118 mm.

Himantopus himantopus Linn.

Charadrius himantopus Linnæus, Syst. Nat. Ed. x. 1758, p. 151 : Egypt.

Small parties of the Black-winged Stilt were observed by the present author on the great swampy plains south of the town Ratburi in Jan. 1915. A winter visitor only, and apparently rare in Siam and the Malay Peninsula.

Numenius arquata Linn.

Scolopax arquata Linnæus, Syst. Nat. Ed. x. 1758, p. 145 : Sweden.

The Curlew has also been found in Siam during the migrations, but it seems to be rather rare, as it has only been recorded from peninsular Siam and Puket.

Numenius phæopus variegatus Scop.

Tantalus variegatus Scopoli, Del. Floræ et Faunæ Insubr. ii. 1786, p. 92 : Luzon.

Found in small numbers along the coast during the wintertime.

Limosa lapponica novæ-zealandiæ Gray.

Limosa novæ-zealandiæ Gray, Gen. Birds, iii. 1847, p. 570 : New Zealand.

Apparently very rare, and hitherto only obtained at Chaya, near Bandon, peninsular Siam.

Limosa limosa melanuroides Gould.

Limosa melanuroides Gould, P. Z. S. Lond. 1846, p. 84 : Port Essington, Australia.

The Eastern Black-tailed Godwit is apparently very rare in Siam, and has hitherto only been obtained at Bangkok and on the small island of Koh Khwai in the Inner Gulf of Siam.

Macrorhamphus griseus tackzanowskia Verr.

Micropalama tackzanowskia Verreaux, Rev. et Mag. Zool. 1860, p. 206, pl. 14 : Dauria.

An extremely rare bird. In Siam it has hitherto only been met with near the mouth of the Lakon River in peninsular Siam.

Totanus totanus Linn.

Scolopax totanus Linnæus, Syst. Nat. Ed. x. 1758, p. 145: Sweden.

A winter visitor to Siam, where specimens have been collected at various localities in central and peninsular Siam.

Totanus stagnatilis horsfieldii Sykes.

Limosa horsfieldii Sykes, P. Z. S. Lond. 1833, p. 163: Dukhun, India.

Hitherto only obtained in central Siam, where specimens have been collected at Bang Boon, Tachin, and Bangplasoi. The Siamese specimens, though recorded under the heading of *Totanus stagnatilis* Bechst., probably belong to the eastern form if really distinct from the European birds.

Totanus fuscus Linn.

Scolopax fusca Linnæus, Syst. Nat. Ed. xii. 1766, p. 243: Sweden.

The Spotted Redshank is apparently extremely rare in Siam, where up to the present time only a single specimen has been obtained in the neighbourhood of Chainat, central Siam.

Helodromas ocrophus Linn.

Tringa ocrophus Linnæus, Syst. Nat. Ed. x. 1758, p. 149: Sweden.

Not uncommon during the winter months. Mathews (Austral. Avian Record, i. 1913, p. 188) has separated the eastern form of the Green Sandpiper under the name of *Helodromas ocrophus assami* (typical locality Assam), but this subspecies is of doubtful validity.

Tringoides hypoleucos Linn.

Tringa hypoleucos Linnæus, Syst. Nat. Ed. x. 1758, p. 149: Sweden.

Quite common throughout the whole country during the winter months.

Terekia cinerea Güldenst.

Scolopax cinerea Güldenstädt, Nov. Comm. Ac. Petrop. xix. 1775, p. 473: Terek River, S.E. Russia.

Common along the coasts of Siam during the winter months, where it occurs in company with the other small Waders. Authentic specimens recorded from Patani, Trang, and from the mouth of the Menam Chao Phya River.

Glottis nebularius Gunn.

Scolopax nebularia Gunnerus, in Leem's Lappl. Beskr. 1767, p. 251 (note): Lapland.

Fairly common along the coasts of Siam during the winter. It has also been collected several times in central Siam, where it occurs on the extensive swampy plains which occupy such a large area of land in these districts. Eastern specimens have been separated under the name of *Glottis nebularius glottoides* by Vigors (P. Z. S. Lond. 1831, p. 173), and, if distinct, the Siamese birds belong to this form.

Rhyacophilus glareola Linn.

Tringa glareola Linnæus, Syst. Nat. Ed. x. 1758, p. 149: Sweden.

One of the most common Sandpipers in Siam during the migrations. The eastern birds have been separated on account of their supposed smaller size under the name *Rhyacophilus glareola affinis* Horsfield (Trans. Linn. Soc. Lond. xiii. 1821, p. 191), the type-locality of which is Java.

Limonites temminckii Leisl.

Tringa temminckii Leisler, in Bechst. Naturg. Deutschl. Nachträg, 1812, p. 78: Hanau, Germany.

Authentic specimens hitherto only recorded from Bangkok.

Limonites minuta ruficollis Pall.

Tringa ruficollis Pallas, Reise Russ. Reichs, iii. 1776, p. 700: Siberia.

A winter visitor to Siam, where specimens have been obtained at Patani.

Limonites minutilla subminuta Middend.

Tringa subminuta Middendorff, Sibirische Reise, 1851, p. 222: Siberia.

Apparently rare and only obtained during the winter months, when specimens have been collected at Bangkok, Sop Tue, and on Puket Island.

Limonites minuta minuta Leisl.

Tringa minuta Leisler, in Bechst. Naturg. Deutschl. Nachträg, 1812, p. 74: Hanau, Germany.

Recorded from Patani in peninsular Siam as well as from the island of Puket.

Limicola falcinellus Brünnich.

Scolopax falcinellus Brünnich, Ornith. Boreal. 1764, p. 49: Siælandia (*i. e.* Zealand).

This is the correct name for the Broad-billed Sandpiper formerly known as *Limicola platyrhyncha* Temm. In Siam specimens have been collected at Kampong Budi, Patani, and at the mouth of the Menam Chao Phya River. Eastern birds have been separated on account of their paler coloration under the name of *Limicola falcinellus sibirica* Dresser (P. Z. S. Lond. 1876, p. 674).

Tringa tenuirostris Horsf.

Totanus tenuirostris Horsfield, Trans. Linn. Soc. Lond. xiii. 1821, p. 192: Java.

Williamson has recently (Journ. Nat. Hist. Soc. Siam, iii. No. 1, 1918, p. 35) recorded this species, though under the name of *Tringa crassirostris* Temm., from Lat Yai, near Meklong, in central Siam, where he found it in considerable numbers in February 1918.

Tringa ferruginea chinensis J. E. Gray.

Tringa (*Pelidna*) *chinensis* J. E. Gray, Zool. Misc. 1831, p. 2: China.

The correct name for the bird formerly known as *Anchylochilus subarquatus* Güldenstädt will be *T. ferruginea* Brünnich (Ornith. Boreal. 1764, p. 53). In Siam it has been collected a few times—viz., at Patani, at Lakon, and at Chaya in the province of Bandon. The eastern birds have been separated by J. E. Gray under the above-mentioned name.

Gallinago sthenura Kuhl.

Scolopax sthenura Kuhl, in Bp. Ann. di Stor. Nat. Bologna, xiv. 1830, p. 335 : Sunda Islands.

The Pintail Snipe is rather common throughout the whole country during the winter months, and it probably breeds in Siam too.

Gallinago gallinago Linn.

Scolopax gallinago Linnæus, Syst. Nat. Ed. x. 1758, p. 147 : Sweden.

Very common in suitable localities during the winter months throughout the whole country.

(**Gallinago megala** Swinh.

Gallinago megala Swinhoe, Ibis, 1861, p. 343: Peking, China.

The Larger Pintail most certainly occurs in Siam, though no authentic specimens have hitherto been recorded from that country.)

Scolopax rusticola rusticola Linn.

Scolopax rusticola Linnæus, Syst. Nat. Ed. x. 1758, p. 146 : Sweden.

The Woodcock has been met with a few times in northern and central Siam during the winter-time. Apparently rather rare.

Rostratula capensis Linn.

Scolopax capensis Linnæus, Syst. Nat. Ed. xii. 1766, p. 246 : S. Africa.

Fairly abundant in suitable localities in northern and central Siam.

Family Rallidæ.

Hypotænidia striata Linn.

Rallus striatus Linnæus, Syst. Nat. Ed. xii. 1766, p. 262 : Philippines.

Not common in Siam, where it has only been met with in the neighbourhood of Bangkok and on Puket Island.

Rallina superciliaris Eyton.

Rallus superciliaris Eyton, Ann. & Mag. Nat. Hist. (1) xvi. 1845, p. 230 : Malay Peninsula.

Mr. C. Boden Kloss obtained a single male specimen of this bird at Ok Yam in south-eastern Siam, near the coast of the Gulf.

Rallina fasciata Raffl.

Rallus fasciatus Raffles, Trans. Linn. Soc. Lond. xiii. 1821, p. 328 : Sumatra.

Specimens identified as this bird have been collected near Koon Tan in the north, and at Patani, Biserat, and Ban Kok Klap in peninsular Siam. Also recently obtained on Pulu Terutau.

Porzana pusilla auricularis Reichw.

Ortygometra auricularis Reichenow, Journ. f. Ornith. 1898, p. 139 : India.

Recently obtained at Minburi, east-north-east of Bangkok, by Major-General E. W. Trotter. Williamson has also met with it at the outskirts of Bangkok. Formerly it was only recorded from Patelung in peninsular Siam.

Porzana fusca erythrothorax Temm. & Schleg.

Gallinula erythrothorax Temminck & Schlegel in Siebold's Fauna Japon., Aves, 1850, p. 121 : Japan.

This race has hitherto been recorded from Bangkok, Koh Samui, and from Patani in the southern parts of peninsular Siam. Most probably only a winter visitor.

Amaurornis phœnicura chinensis Bodd.

Fulica chinensis Boddaert, Tabl. Pl. Enl. 1783, p. 54 : Hongkong, China.

Occurs in suitable localities throughout the whole country, where it seems to be quite common.

Gallinula chloropus parvifrons Blyth.

Gallinula parvifrons Blyth, Journ. Asiat. Soc. Bengal, xii. 1843, p. 180 : Calcutta.

This race is similar to the typical form but smaller. It has been found in northern, central, and south-eastern Siam.

The allied race *Gallinula chloropus orientalis* Horsfield (Trans. Linn. Soc. Lond. xiii. 1820, p. 195: type-locality, Java) may also eventually be found in Siam. This latter race is easily distinguished by its bluish slate-coloured upper wing-coverts, which lack the olivaceous-brown edges found in the typical European and other races. Outside Java it inhabits Sumatra, Celebes, and the Malay Peninsula.

Gallicrex cinerea Gm.

Fulica cinerea Gmelin, Syst. Nat. i. pt. 2, 1789, p. 702: China.

Apparently confined to central, south-western, and peninsular Siam. Specimens recorded from Bangkok, Patelung, and from the province of Ratburi.

Porphyrio poliocephalus poliocephalus Lath.

Gallinula poliocephala Latham, Ind. Ornith., Suppl. 1801, p. lxviii: India.

Not uncommon on the swampy plains of northern and central Siam. Southern limits of range not properly ascertained up to the present time.

Porphyrio calvus edwardsi Elliot.

Porphyrio edwardsi Elliot, Ann. & Mag. Nat. Hist. (5) i. 1878, p. 98: Cochin China.

Stated to be found in Siam (*vide* Ibis, 1864, p. 246, note), but no recent specimens have been recorded.

Heliopais personata Gray.

Podica personata Gray, P. Z. S. Lond. 1848, p. 90: Malacca.

The Masked Finfoot is very rare in Siam, where specimens have only been obtained at Biserat and Jalor in peninsular Siam, as well as at Muang Khlung in south-eastern Siam, and on the island of Koh Pennan, off the eastern coast of peninsular Siam.

Family PARRIDÆ.

Hydrophasianus chirurgus Scop.

Tringa chirurgus Scopoli, Del. Floræ et Faunæ Insubr. ii. 1786, p. 92: Philippines.

Not uncommon in suitable localities in central and south-western Siam, but hitherto not recorded from the northern districts.

Metopidius indicus Lath.

Parra indica Latham, Ind. Orn. ii. 1790, p. 765 : India.

Rather common in suitable localities throughout the whole country.

Family GRUIDÆ.

Antigone sharpii Blanf.

Grus (Antigone) sharpii Blanford, Bull. Brit. Ornith. Club, v. 1895, p. vi : Burma.

Occurs in suitable localities throughout the whole country, though always in limited numbers. Generally an inhabitant of open, marshy plains.

Family PLEGADIDÆ.

Threskiornis melanocephalus Lath.

Tantalus melanocephalus Latham, Ind. Orn. ii. 1790, p. 709 : India.

Recorded from Ratburi and Petchaburi in south-western as well as from Bandon in peninsular Siam. It also occurs in large numbers on the great swampy plains of central Siam.

Thaumatibis gigantea Oust.

Ibis gigantea Oustalet, Bull. Soc. Philom. Paris, (7) i. 1877, p. 25 : Cochin China.

One of the rarest of known birds. In Siam it has been met with at Krongmon in Trang by Robinson and Kloss. Another specimen was obtained at Ban Tup Takoh, near Chom Beung, in the province of Ratburi by Mr. K. G. Gairdner.

Graptocephalus davisoni Hume.

Geronticus davisoni Hume, Stray Feathers, iii. 1875, p. 300 : Pakchan, S. Tenasserim.

Authentic specimens of Davison's Black Ibis have been collected at Lay Song Hong (Trang), at Bandon and Nong

Kok and on the islands of Pulu Lontar and Puket. Apparently rather rare, and hitherto not obtained in the northern districts.

Family CICONIIDÆ.

Dissoura episcopus neglecta Finsch.

Dissoura neglecta Finsch, Ornith. Monatsber. 1904, p. 94 : Java.

A migratory bird, found in several parts of Siam though hitherto not recorded from the northern districts. This race inhabits Java, Sumbawa, Lombok, Celebes, and the Philippines, and differs from the typical form, which is found in India, by having a well-defined area from the ear-opening down the neck and the sides of the head perfectly naked. The typical form is probably also found in Siam.

Leptoptilus dubius Gm.

Ardea dubius Gmelin, Syst. Nat. i. pt. 2, 1789, p. 624 : India.

The Large Adjutant is found throughout the whole country, though it apparently becomes more rare in the southern districts.

Leptoptilus javanicus Horsf.

Ciconia javanica Horsfield, Trans. Linn. Soc. Lond. xiii. 1821, p. 188 : Java.

Not uncommon in suitable localities in peninsular, south-western, and the southern parts of central Siam. Rather shy and not easy to obtain.

Xenorhynchus asiaticus Lath.

Mycteria asiatica Latham, Ind. Orn. ii. 1790, p. 670 : India.

The Black-necked Stork frequents the banks of large rivers, tanks, and marshes, and is generally seen singly or in pairs. Within Siamese territory it has been met with in Trang, in Ratburi and Petchaburi, along the Menam Chao Phya River, and on the swamps of northern Siam.

Pseudotantalus leucocephalus Penn.

Tantalus leucocephalus Pennant, Ind. Zool. xi. 1769, p. 47, pl. 10 : Ceylon.

Recorded as being common in Bandon. Gairdner has also met with it in Ratburi and Petchaburi.

Anastomus oscitans Bodd.

Ardea oscitans Boddaert, Tabl. Pl. Enl. 1783, p. 55, pl. 932 : Pondichery.

Gairdner has recorded this species from the provinces of Ratburi and Petchaburi in south-western Siam, and Williamson has recently obtained it near Prom-den, on the railway between Bangkok and Tachin, and at Ta-rüa in central Siam.

Family Ardeidæ.

Pyrrherodias purpurea manillensis Meyen.

Ardea purpurea var. *manillensis* Meyen, Acta Acad. Leop. Car. xvi. Suppl. 1833, p. 102 : Manila.

The Eastern Purple Heron is usually found among the high grass and reeds covering the large swamps of central Siam. It has also been recorded from peninsular Siam, where specimens have been collected at Patelung, and on the island of Puket.

Ardea cinerea jouyi Clark.

Ardea cinerea jouyi Clark, Proc. U.S. Nat. Mus. xxxii. 1907, p. 468 : Corea.

Eastern specimens of the Common Heron have been separated by Clark under the above-mentioned name on account of their having the wing-coverts decidedly paler, almost ashy white. A winter visitor to Siam, where it seems to be fairly common in the southern and central parts.

Ardea sumatrana sumatrana Raffl.

Ardea sumatrana Raffles, Trans. Linn. Soc. Lond. xiii. 1822, p. 325 : Sumatra.

Specimens of the Dusky-grey Heron have hitherto only been obtained on Pulu Terutau, Koh Pennan, and on Koh Mehsi West.

Mesophoyx intermedia Wagl.

Ardea intermedia Wagler, Isis, 1829, p. 659 : Java.

The Smaller Egret is rather common in suitable localities throughout central Siam, especially in the swampy country along the course of the Menam Chao Phya River. It has also been obtained on the shores of the Inner Gulf of Siam during the winter-time.

Herodias alba modesta J. E. Gray.

Ardea modesta J. E. Gray, Zool. Misc. 1831, p. 19 : India.

The Large Egret is fairly common in suitable localities throughout Siam, where it, however, only occurs during the winter months.

Garzetta garzetta Linn.

Ardea garzetta Linnæus, Syst. Nat. Ed. xii. 1766, p. 237 : "Habitat in Oriente."

A winter visitor to Siam, where authentic specimens have been collected at Tachin, Bangkok, Anghin, Bang Phra (C. Siam), at Jambu and Jhering (peninsular Siam), as well as on the island of Puket.

Demigretta sacra Gm.

Ardea sacra Gmelin, Syst. Nat. i. pt. 2, 1789, p. 640 : Tahiti.

Occurs in limited numbers along the coasts of Siam. Specimens in the blue phase seem to be more abundant than those in the white.

Nycticorax nycticorax Linn.

Ardea nycticorax Linnæus, Syst. Nat. Ed. x. 1758, p. 142 : S. Europe.

Winters in Siam, where it, however, appears to be rare. Hitherto it has only been recorded from Bangkok.

Gorsachius melanolophus Raffl.

Ardea melanolopha Raffles, Trans. Linn. Soc. Lond. xiii. 1822, p. 326 : Sumatra.

Apparently rare in peninsular and south-western Siam. It has, however, also recently been obtained in northern as well as at Lat Bua Kao in eastern Siam.

Butorides striatus javanica Horsf.

Ardea javanica Horsfield, Trans. Linn. Soc. Lond. xiii. 1821, p. 190 : Java.

Generally distributed throughout the whole country, though less abundant in the northern districts.

Ardeola grayii Sykes.

Ardea grayii Sykes, P.Z.S. Lond, 1832, p. 158 : Deccan.

Apparently distributed throughout the whole country, where it mostly occurs in the rice-fields.

Ardeola bacchus Bp.

Buphus bacchus Bonaparte, Consp. Gen. Av. ii. 1855, p. 127 : Malacca.

The Chinese Pond-Heron has been recorded from several localities in northern and eastern Siam, and it has also been found on Koh Mak, Koh Samui, and Puket. In the winter plumage it is hardly possible to separate this species from *Ardeola grayii* Sykes.

Bubulcus coromandus Bodd.

Cancroma coromanda Boddaert, Tabl. Pl. Enl. 1783, p. 54 : Coromandel coast.

Very common throughout the whole country.

Ixobrychus sinensis Gm.

Ardea sinensis Gmelin, Syst. Nat. i. pt. 2, 1789, p. 642 : China.

The Yellow Bittern appears to be generally distributed throughout Siam. It frequents marshes, dense swampy thickets, or hides in the rice-fields, and is seldom seen.

Ixobrychus cinnamomeus Gm.

Ardea cinnamomea Gmelin, Syst. Nat. i. pt. 2, 1789, p. 643 : China.

The Chestnut Bittern occurs on the same localities as the former species ; it is perhaps more common.

Dupetor flavicollis flavicollis Lath.

Ardea flavicollis Latham, Ind. Orn. ii. 1790, p. 701 : S. China.

Apparently rather rare in Siam, though it has been recorded from several parts of the country.

Botaurus stellaris Linn.

Ardea stellaris Linnæus, Syst. Nat. Ed. x. 1758, p. 144: Sweden.

A winter visitor to Siam, where it seems to be extremely rare, as it has hitherto only been recorded by Barton from Raheng in the northern parts of central Siam.

Family Podicipedidæ.

Podiceps fluviatilis albipennis Sharpe.

Tachybaptes albipennis Sharpe, Bull. Brit. Ornith. Club, iv. 1894, p. iv: Indian Peninsula.

The Indian Little Grebe has recently been recorded by Williamson from Prom-den in central Siam, and from Muang Khlung in the province of Chantaburi, south-eastern Siam. Otherwise it has only been met with within Siamese territory at Patelung in the southern parts of peninsular Siam.

Family Laridæ.

Larus brunnicephalus Jerd.

Larus brunnicephalus Jerdon, Madras Journ. Lit. Sci. xiii. 1840, p. 225: W. coast of India.

Not uncommon on the Inner Gulf of Siam, where specimens have been obtained at Paknam and Tachin. Sometimes it may also be found along the course of the Menam Chao Phya River, at least as far as Bangkok.

Hydrochelidon leucopareia Temm.

Sterna leucopareia Temminck, Man. d'Orn. ii. Ed. 2, 1820, p. 746: Hungary.

Fairly common in the Inner Gulf of Siam and along the coasts of south-western and peninsular Siam.

Hydrochelidon leucoptera grisea Horsf.

Sterna grisea Horsfield, Trans. Linn. Soc. Lond. xiii. 1821, p. 199: Java.

Recently recorded by Williamson from the neighbourhood of Bangkok, though under the heading of *Hydrochelidon* *leucoptera* Meisner & Schinz. The Siamese specimens, however, most certainly belong to the Javan race named *Sterna grisea* by Horsfield.

Hydroprogne caspia strenua Gould.

Sylochelidon strenuus Gould, P. Z. S. Lond. 1846, p. 21 : Port Stephens, New South Wales.

Some specimens of the Caspian Tern were recently obtained by Williamson at Tachin, central Siam. The collector records them under the name of *Hydroprogne caspia* Pall., but they most certainly belong to the eastern race named by Gould.

Gelochelidon nilotica Gm.

Sterna nilotica Gmelin, Syst. Nat. i. pt. 2, 1789, p. 606: England.

Williamson records a pair of this Tern from Bangplasoi, a coastal village in south-eastern Siam.

Thalasseus bergii cristata Steph.

Sterna cristata Stephens, in Shaw's Gen. Zool. xi. 1826, p. 146 : China.

Specimens of the Large Crested Tern have been collected at Tanjong Patani and on the islands of Terutau, Koh Phai and Koh Rin, the two latter situated in the Inner Gulf of Siam.

Sterna hirundo tibetana Saund.

Sterna tibetana Saunders, P. Z. S. Lond. 1876, p. 649 : Tibet.

Authentic specimens hitherto only recorded from Pulu Terutau, off the western coast of peninsular Siam.

Sterna fuscata Linn.

Sterna fuscata Linnæus, Syst. Nat. Ed. xii. 1766, p. 228 : St. Domingo.

A single specimen has been recorded from Siam by Parrot. It is stated to have been obtained at the Petchaburi river in south-western Siam. Formerly known as *Sterna fuliginosa* Gm.

Sterna anætheta Scop.

Sterna anæthetus Scopoli, Del. Floræ et Faunæ Insubr. ii. 1786, p. 92: Philippines.

Found on the islands of Koh Phai and Koh Rin in the Inner Gulf of Siam. It breeds here and probably also on some of the neighbouring islands.

Sterna sumatrana Raffl.

Sterna sumatrana Raffles, Trans. Linn. Soc. Lond. xiii. 1822, p. 329: Sumatra.

Found breeding in large numbers on Koh Phai and Koh Rin, islands situated in the Inner Gulf of Siam. Also recorded from Koh Pennan, off the eastern coast of peninsular Siam.

Sterna dougallii Mont.

Sterna dougallii Montagu, Ornith. Dict., Suppl. 1813: Scotland.

Obtained on Koh Pennan and on Koh Rin. According to Williamson not uncommon at certain seasons at the head of the Gulf of Siam.

Sterna seena Sykes.

Sterna seena Sykes, P. Z. S. Lond. 1832, p. 171: Deccan.

Authentic specimens of the Indian River Tern have been recorded from several localities in south-western and peninsular Siam. Hitherto not obtained in the northern districts.

Anous stolidus pileatus Scop.

Sterna pileata Scopoli, Del. Floræ et Faunæ Insubr. ii. 1786, p. 92: Philippines.

The Noddy has recently been found breeding on a small islet a few miles south of Koh Chuan in the Inner Gulf of Siam.

Family Anatidæ.

Sarkidiornis melanotus melanotus Penn.

Anser melanotus Pennant, Ind. Zool. 1769, p. 12, pl. xi.: Ceylon.

The Comb-Duck appears to be rather rare in Siam.

Williamson has recently recorded a single male specimen from Klong Luang Peng, near Bangkok, central Siam. The present author saw some specimens kept in captivity by the Lao Prince of Chiengmai, and these were said to have been caught somewhere in northern Siam.

Asarcornis leucoptera Blyth.

Sarcidiornis (?) *leucoptera* Blyth, Journ. Asiat. Soc. Bengal, xviii. 1849, p. 820 : Tenasserim.

The White-winged Wood-Duck occurs sparsely in peninsular, south-western, and central Siam. It seems to be more abundant in the southern districts, where specimens have been recorded from Bandon, Ban Kok Klap, Nong Kok, Patelung, Chong, Hue Sai, and Hat Sanuk. In central Siam it has hitherto only been met with at Meh Wang, according to Barton. It is a shy bird, generally found singly or in pairs.

Nettopus coromandelianus Gm.

Anas coromandeliana Gmelin, Syst. Nat. i. pt. 2, 1789, p. 522 : Coromandel coast.

Appears to be generally distributed throughout the whole country.

Dendrocygna javanica Horsf.

Anas javanica Horsfield, Trans. Linn. Soc. Lond. xiii. 1821, p. 199 : Java.

The Whistling Teal is quite common in suitable localities throughout the whole country.

Dendrocygna fulva Gm.

Anas fulva Gmelin, Syst. Nat. i. pt. 2, 1789, p. 530 : "Nova Hispania."

Barton states that the Large Whistling Teal most certainly occurs near Raheng in the northern parts of central Siam, but no authentic specimens have yet been collected within Siamese territory.

Spatula clypeata Linn.

Anas clypeata Linnæus, Syst. Nat. Ed. x. 1758, p. 124 : Sweden.

The Shoveler seems to be extremely rare in Siam, and has only been recorded on one occasion. Mr. A. H. Duke obtained a drake in non-breeding plumage at Klong Luang Peng in central Siam on the 22nd of January, 1916. A winter visitor only.

Querquedula querquedula Linn.

Anas querquedula Linnæus, Syst. Nat. Ed. x. 1758, p. 126 : Sweden.

A winter visitor to Siam and not very abundant. Hitherto only recorded from the provinces of Ratburi and Petchaburi and from the neighbourhood of Bangkok.

Dafila acuta Linn.

Anas acuta Linnæus, Syst. Nat. Ed. x. 1758, p. 126 : Sweden.

Some specimens kept in captivity by the Lao Prince of Chiengmai were said to have been caught at Pra Yao, a small town in northern Siam.

Anas pœcilorhyncha Forst.

Anas pœcilorhyncha Forster, in Pennant's Ind. Zool. xiii. 1781, p. 23, fig. 1 : Ceylon.

A small party of ducks, probably belonging to this species, were observed in the Meh Ping River, a few miles south of Keng Soi, by the present author in 1914.

Family PHALACROCORACIDÆ.

Phalacrocorax carbo Linn.

Pelecanus carbo Linnæus, Syst. Nat. Ed. x. 1758, p. 133 : Sweden.

The Large Cormorant occurs in peninsular and central Siam. It appears to be most common in the central parts of the country, where it may be seen in great numbers.

Phalacrocorax fuscicollis Steph.

Phalacrocorax fuscicollis Stephens, in Shaw's Gen. Zool. xiii. 1826, pt. i. p. 91 : Bengal.

Williamson has recently recorded this species from Klong

Pho Thao, off Klong Samrong, 24 miles south-east of Bangkok, and states that they were very common at that locality.

Phalacrocorax pygmæus javanicus Horsf.

Carbo javanicus Horsfield, Trans. Linn. Soc. Lond. xiii. 1821, p. 197 : Java.

The Little Cormorant is very common on suitable localities throughout south-western and central Siam. It has also been found along the rivers and creeks of northern Siam, where it, however, apparently is less abundant.

Family PLOTIDÆ.

Plotus melanogaster Penn.

Anhinga melanogaster Pennant, Ind. Zool. 1769, p. 53, pl. 15 : Ceylon.

The Snake-Bird is generally found in suitable localities throughout the whole country, and it appears to be rather common.

Family SULIDÆ.

Sula sula Linn.

Pelecanus sula Linnæus, Syst. Nat. Ed. xii. 1766, p. 218 : Jamaica.

The Brown Gannet is found in tropical seas throughout the world. From Siamese territory it has only been recorded from Koh Rin and Koh Chuan, both small rocky islands situated in the Inner Gulf of Siam.

Family FREGATIDÆ.

Fregata andrewsi Mathews.

Fregata andrewsi Mathews, Aust. Av. Rec. ii. 1914, p. 120 : Christmas Isl.

Within Siamese territory this Frigate-Bird has hitherto only been met with at Puket, off the western coast of peninsular Siam.

Family PELECANIDÆ.

Pelecanus philippensis Gm.

Pelecanus philippensis Gmelin, Syst. Nat. i. pt. 2, 1789, p. 571: Philippines.

The Spotted-billed Pelican has been recorded from south-western, central, and northern Siam, where it occurs in large numbers in suitable localities. It probably breeds in Siam, though no definite records of its nesting in the country have been published.

LIST OF THE PRINCIPAL PAPERS RELATING TO THE BIRDS OF SIAM.

C. S. BARTON. A short list of the Birds from the Raheng District. (Journ. Nat. Hist. Soc. Siam, vol. i. 1914, pp. 105–109.)

E. BLYTH. Catalogue of Mammals and Birds of Burma. (Journ. Asiat. Soc. Bengal, 1875, Part II. Extra number: Birds, pp. 54–166.)

C. BODEN KLOSS. On two new races of *Palæornis eupatria* Linn. (Journ. Nat. Hist. Soc. Siam, vol. ii. 1917, pp. 218–220.)

—— On Birds recently collected in Siam. Part I. Phasianidæ—Eurylæmidæ. (Ibis, 1918, pp. 76–114.)

—— On Birds recently collected in Siam. Part II. Passeres. (Ibis, 1918, pp. 189–234.)

—— Notes on the new subspecies of Siamese birds described in the Bull. Brit. Ornith. Club, No. ccxxvii. pp. 8–9. (Bull. Brit. Ornith. Club, vol. xxxviii. 1918, p. 65.)

—— Siamese Birds. (Ibis, 1918, pp. 518, 519.)

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XXXI.—*A List of the Birds of the Anglo-Egyptian Sudan, based on the Collections of Mr. A. L. Butler, Mr. A. Chapman and Capt. H. Lynes, R.N., and Major Cuthbert Christy, R.A.M.C.* (*T.F.*). Part IV. (*concluded*). PELECANIDÆ—STRUTHIONIDÆ. By W. L. SCLATER, M.B.O.U., and C. MACKWORTH-PRAED, M.B.O.U. *

(Plate XVIII.)

THIS, the fourth portion of the list of the Birds of the Sudan, is the final one of a rather lengthy paper. The previous parts appeared in 'The Ibis' of July 1918, October 1918, and October 1919. Since the other parts were printed, more material has come to hand from the Sudan, and nomenclature has in some cases been changed, with the result that a list of Addenda and Corrigenda is necessary to bring these parts up to date. We are indebted to Major Claude Graham for some most interesting birds from the Nuba Mountains in Kordofan, notably a pair of the White-capped Chat, *Thamnolæa albiscapulata*, or its local representative.

We have also examined a collection of birds from the Khartoum Museum sent home by Mr. H. H. King, the Sudan Government Entomologist, including one or two species new to the Sudan, and to him (as well as, of course, to the authorities of the Natural History Museum) we are particularly grateful.

For the convenience of readers, we reprint the map of the Sudan (Pl. XVIII.) and also the abbreviations used for the names of the Provinces, which are as follows :—

Ber. = Berber Province, **R.S.** = Red Sea Province, **Kas.** = Kassala, **Sen.** = Sennar, **B.N.** = Blue Nile Province, **Kh.** = Khartoum Province, **Kor.** = Kordofan Province, **W.N.** = White Nile Province, **U.N.** = Upper Nile Province, **B.G.** = Bahr-el-Ghazal, **Mon.** = Mongalla Province, and **L.E.** = Lado Enclave.

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* [Owing to Mr. Sclater's absence abroad, the junior author is entirely responsible for this Part of the paper.—C. W. M. PRAED.]

The word "Sudan," as used in this part of the paper, means the Anglo-Egyptian Sudan only.

The following new races are described in this instalment :—

Stigmatopelia senegalensis sudanensis.
Turtur afra mearnsi.
Ptilopachus petrosus butleri.
Ptilopachus petrosus ladoensis.

We had hoped to be able to give, at the conclusion of this paper, some remarks on the general relationship and distribution of the Sudanese avifauna, as well as on the migrants both Palæarctic and "Inter-tropical" which occur in the country, but at the moment space and time alike forbid.

Family Pelecanidæ.

Pelecanus onocrotalus subsp.

Pelecanus onocrotalus Linn. Syst. Nat. 10th ed. 1758, p. 132 : Africa ; Reichw. V. A. i. p. 99 ; Butler, Ibis, 1905, p. 381.

[C. & L. coll.] 3 Kodok Mch. **U.N.**

There can be little doubt of the occurrence of typical *P. onocrotalus* in the Sudan, but the three specimens collected seem decidedly intermediate between that form and the small eastern form *P. o. roseus* Gmel. They are all females with bills (culmen from tip of feathers) of 310, 325, and 342 mm. *P. o. roseus* is also recorded by Heuglin.

Pelecanus rufescens.

Pelecanus rufescens Gmel. Syst. Nat. i. pt. 2, 1789, p. 571 : West Africa ; Reichw. V. A. i. p. 102 ; Butler, Ibis, 1905, p. 381, 1908, p. 256.

Common in the Sudan, though we have no actual specimens.

Family Sulidæ.

Sula leucogaster subsp. ?

Pelecanus leucogaster Bodd. Pl. Enl. 1783, p. 57, No. 973 (ex Buffon) : Cayenne.

[B. coll.] 1 Port Sudan May, **R.S.**

[C. & L. coll.] 2 Port Sudan Apl. **R.S.**

We have not sufficient material to enter into the races of this bird. The Brown Booby ranges throughout the tropical and subtropical seas, the form occurring on the Australian coasts being referred to *S. l. plotus* (Forster) by Mathews.

Sula (Parasula) dactylatra melanops.

Sula melanops Heuglin, Ibis, 1859, p. 351 : Somali coast.

No actual records are known to us from the Sudan, but in all probability the bird occurs on the coast of the Red Sea as well.

Family ANHINGIDÆ.

Anhinga rufa.

Plotus rufus Lacépède & Daud. in Buff. Hist. Nat. (18mo, ed. Didot), Quad. xiv. p. 319; Ois. xvii. 1799, p. 81 : Senegal; Butler, Ibis, 1905, p. 381.

Anhinga rufa Reichw. V. A. i. p. 95.

[B. coll.] 1 Jebelein Apl. **U.N.**; 1 Bor May, **Mon.**

[C. & L. coll.] 1 Melut, 1 Meshra Zeraf Jan. **U.N.**

Found on most of the rivers throughout the country.

Family PHALACROCORACIDÆ.

Phalacrocorax carbo subsp.?

Phalacrocorax carbo Reichw. V. A. i. p. 90.

[B. coll.] 1 Khartoum Nov.

This specimen is an immature female of what is apparently the common European Cormorant *P. c. subcormoranus* (Brehm), but we should not like to be certain as to subspecies. The only previous record we know of from the Sudan is one by Brehm from Sennar.

Microcarbo africanus.

Pelecanus africanus Gmelin, Syst. Nat. i. pt. 2, 1789, p. 577 : White Nile (*cf.* Claude Grant, Ibis, 1915, p. 75).

Phalacrocorax africanus Reichw. V. A. i. p. 93; Butler, Ibis, 1905, p. 381.

[B. coll.] 1 Renk, 1 Malakal May, **U.N.**
[C. & L. coll.] 1 Meshra Zeraf Jan. **U.N.**
[Chr. coll.] 1 Yei Dec. **L.E.**

Common and widely distributed.

Family ANATIDÆ.

Sarkidiornis melanotus africanus.

Sarkidiornis africanus Eyton, Mon. Anat. 1838, p. 103: Gambia River.

Sarkidiornis melanotus Reichw. V. A. i. p. 129.

Sarcidiornis melanonota (Penn.) Butler, Ibis, 1905, p. 383, 1908, p. 257.

[B. coll.] 1 Malakal May, **U.N.**

Abundant on the upper Nile.

Nettapus auritus.

Anas aurita Bodd. Tabl. Pl. Enl. 1783, p. 48: Madagascar.

Nettapus auritus Reichw. V. A. i. p. 127; Butler, Ibis, 1905, p. 383.

[B. coll.] 1 Meshra el Rek Mch. **B.G.**
[Chr. coll.] 2 Meridi Feb. **B.G.**

Not uncommon in the southern Sudan, and occurs in Kordofan in the rains.

Casarca ferruginea.

Anas ferruginea Vroeg, Cat. Adumbr. 1764, p. 5: Tartary.

Casarca casarca (Linn.); Reichw. V. A. i. p. 136.

Tadorna casarca Butler, Ibis, 1905, p. 384.

[B. coll.] 1 Khartoum Apl.

The Ruddy Sheld-Duck is abundant on the lower White Nile in winter (*A. L. B.*).

Anas platyrhynchos.

Anas platyrhynchos Linn. Syst. Nat. 10th ed. 1758, p. 125: Europe, restricted type-locality Sweden.

Anas boschas Linn. auctorum.

The Mallard is not at all common in the Sudan, but is recorded by Mr. Butler from the White and Blue Niles.

Anas strepera.

Anas strepera Linn. Syst. Nat. 10th ed. 1758, p. 125: Europe, restricted type-locality Sweden; Reichw. V. A. i. p. 116.

The Gadwall is recorded from Suakin by Heuglin, but Mr. Butler never met with it in the Sudan.

Nettion crecca crecca.

Anas crecca Linn. Syst. Nat. 10th ed. 1758, p. 126: Europe, restricted type-locality Sweden; Reichw. V. A. i. p. 122.

Querquedula crecca Butler, Ibis, 1905, p. 384.

[B. coll.] 1 Khartoum Oct., 1 near Kawa Feb. **U.N.**

[C. & L. coll.] 1 White Nile lat. 14° N. Jan. **W.N.**

The Teal is common, but not so abundant as the Garganey.

Querquedula querquedula.

Anas querquedula Linn. Syst. Nat. 10th ed. 1758, p. 126: Europe, restricted type-locality Sweden; Reichw. V. A. i. p. 121.

Querquedula circia (Linn.); Butler, Ibis, 1905, p. 384, 1908, p. 257.

[B. coll.] 1 Khartoum Mch. 10; 1 Kawa Sept. 30, **U.N.**

[C. & L. coll.] 1 Senga Dec. **Sen.**; 1 White Nile lat. 13° N. Jan. **W.N.**

The Garganey is widely distributed in winter, south to Uganda (*A. L. B.*).

Dafila acuta.

Anas acuta Linn. Syst. Nat. 10th ed. 1758, p. 126: Europe, restricted type-locality Sweden; Reichw. V. A. i. p. 117.

Dafila acuta Butler, Ibis, 1905, p. 384.

[B. coll.] 1 Khartoum Mch. 25, 1 Omdurman Dec. **Kh.**

According to Mr. Butler the Pintail is the most abundant of the winter-visiting Ducks from the north.

Pœcilonetta erythrorhyncha.

Anas erythrorhyncha Gmel. Syst. Nat. i. pt. 2, 1789, p. 517 : Cape of Good Hope; Reichw. V. A. i. p. 118.

The Red-bill is stated by Rüppell to have been obtained in Sennar. We know of no later record.

Spatula clypeata.

Anas clypeata Linn. Syst. Nat. 10th ed. 1758, p. 124: Europe, restricted type-locality Sweden.

Spatula clypeata Reichw. V. A. i. p. 110; Butler, Ibis, 1905, p. 384.

[B. coll.] 4 Khartoum Feb. Mch. Oct.

The Shoveler is another widely distributed species in winter.

Mareca penelope.

Anas penelope Linn. Syst. Nat. 10th ed. 1758, p. 126: Europe, restricted type-locality Sweden; Reichw. V. A. i. p. 117.

Mareca penelope Butler, Ibis, 1905, p. 384.

Mr. Butler mentions that he has several times shot Wigeon at Khartoum, but that it is one of the scarcer winter visitors.

Fuligula fuligula.

Anas fuligula Linn. Syst. Nat. 10th ed. 1758, p. 128: Europe, restricted type-locality Sweden.

Nyroca fuligula Reichw. V. A. i. p. 107.

Fuligula cristata (Leach); Butler, Ibis, 1905, p. 385, 1908, p. 257.

[B. coll.] 4 Khartoum Mch. and "winter."

Nyroca nyroca.

Anas nyroca Güldenst. Nov. Comm. Petrop. xiv. 1770, pt. i. p. 403 : S. Russia.

Nyroca nyroca Reichw. V. A. i. p. 109.

Fuligula nyroca Butler, Ibis, 1908, p. 257.

[B. coll.] 1 Khartoum Mch. 15.

Nyroca ferina.

Anas ferina Linn. Syst. Nat. 10th ed. 1758, p. 126: Europe, restricted type-locality Sweden.

[B. coll.] 2 Khartoum Mch. 6 & 10.

The Pochard is apparently not common in the Sudan. One of these specimens is recorded by Mr. Butler (Ibis, 1908, p. 257) as *Fuligula nyroca,* by an error.

Dendrocygna viduata.

Anas viduata Linn. Syst. Nat. 12th ed. 1766, p. 205: Cartagena, Columbia.

Dendrocygna viduata Reichw. V. A. i. p. 124; Butler, Ibis, 1905, p. 383, 1908, p. 257.

[B. coll.] 2 Malakal May & June, **U.N.**; 4 Mongalla July–Sept. **Mon.**

[C. & L. coll.] 1 White Nile lat. 14° N. Jan. **W.N.**

The Whitehead Duck is plentiful in the Sudan; Mr. Butler mentions that he once heard of a flock as far north as Halfa. There appears to be no difference between African and South American examples of this species.

Dendrocygna fulva.

Anas fulva Gmel. Syst. Nat. i. pt. 2, 1789, p. 530: "New Spain," *i.e.* Mexico (ex Brisson).

Dendrocygna fulva Reichw. V. A. i. p. 126; Butler, Ibis, 1905, p. 383.

[B. coll.] 1 Khartoum June.

The Whistling Duck has the same range in the Sudan as *D. viduata,* but numerically is much scarcer (*A. L. B.*).

Plectropterus gambensis rüppelli.

Plectropterus rüppelli Sclater, P. Z. S. 1859, p. 131, pl. 153: "Eastern Africa"; Butler, Ibis, 1905, p. 382, 1908, p. 256.

The Spur-winged Goose is widely distributed. We have no knowledge of the form known as *P. niger* (Sclater, P. Z. S. 1877, p. 47) ever having occurred in the Sudan, but

Dr. Sassi (Ann. Nat. Hist. Hofmus. Wien, xxi. 1906, p. 52) records an example from Duem with mixed black and white feathers on the underside.

Alopochen ægyptiacus.

Anas ægyptiaca Linn. Syst. Nat. 12th ed. i. 1766, p. 197: Egypt.

Chenalopex ægyptiacus Reichw. V. A. i. p. 131; Butler, Ibis, 1905, p. 383, 1908, p. 257.

[C. & L. coll.] 1 White Nile Jan.

The Egyptian Goose is particularly abundant on the White Nile.

Family PHŒNICOPTERIDÆ.

Phœnicopterus antiquorum.

Phœnicopterus antiquorum Temm. Man. d'Orn. 2nd ed. ii. 1820, p. 587: Europe.

Phœnicopterus roseus Pall.; Reichw. V. A. i. p. 349.

The Flamingo is recorded by Heuglin from the White Nile and Suakin.

Phœniconaias minor.

Phœnicopterus minor Geoffr. Bull. Sc. Soc. Philom. 1798, p. 98: Senegal; Reichw. V. A. i. p. 352.

Recorded by Rüppell from the southern coast of the Red Sea and by Mr. Butler from the White Nile.

Family ARDEIDÆ.

Ardea cinerea cinerea.

Ardea cinerea Linn. Syst. Nat. 10th ed. 1758, p. 143: Europe, restricted type-locality Sweden; Reichw. V. A. i. p. 379; Butler, Ibis, 1905, p. 372, 1908, p. 255.

[B. coll.] 1 Khartoum Oct. 25.

Ardea melanocephala.

Ardea melanocephala Vig. & Childr. in Denh. & Clapp. Trav. ii. App. 1826, p. 201, probably near Lake Chad; Reichw. V. A. i. p. 380; Butler, Ibis, 1905, p. 372, 1908, p. 255.

[B. coll.] 1 Wad Medani Nov. **Sen.**; 1 Upper Nile Feb., 2 Malakal May, **U.N.**

[C. & L. coll.] 1 Melut, 1 Jebelein Jan. **U.N.**

[Chr. coll.] 1 Tembura Mch. **B.G.**; 1 Yei Nov. **L.E.**

Ardea (Typhon) goliath.

Ardea goliath Cretzschmar, Atlas, 1826, p. 39, pl. 26: "Bahhar Abiad" = Bahr el Abiad; Reich. V. A. i. p. 376; Butler, Ibis, 1905, p. 372, 1908, p. 255.

[B. coll.] 1 Malakal May, **U.N.**

[C. & L. coll.] 1 Meshra Zeraf Jan., 1 nr. Tonga Feb., 1 Lake No Feb. **U.N.**

Ardea (Phoyx) purpurea purpurea.

Ardea purpurea Linn. Syst. Nat. 12th ed. i. 1766, p. 236: France; Reichw. V. A. i. p. 377; Butler, Ibis, 1905, p. 372, 1908, p. 255.

[B. coll.] 1 Khartoum Oct., 1 nr. Shambé May, **Mon.**

[C. & L. coll.] 1 Jebel Ahmed Agha Jan. **U.N.**

All these four species of Herons are common near water in the Sudan, the Common and the Purple being the most abundant.

Egretta (Casmerodius) alba alba.

Ardea alba Linn. Syst. Nat. 10th ed. 1758, p. 144: Europe, restricted type-locality Sweden.

Herodias alba Reichw. V. A. i. p. 388; Butler, Ibis, 1905, p. 372.

[B. coll.] 1 Malakal May, **U.N.**

[C. & L. coll.] 1 Melut Jan. **U.N.**

Egretta garzetta garzetta.

Ardea garzetta Linn. Syst. Nat. 12th ed. i. 1766, p. 237: "in Oriente."

Herodias garzetta Reichw. V. A. i. p. 387.

[B. coll.] 1 Malakal May, **U.N.**

[C. & L. coll.] 1 Kosti Jan. **W.N.**

Mesophoyx intermedius brachyrhynchus.

Herodias [*Egretta*] *brachyrhynchos* Brehm, J. f. O. 1858, p. 471: Blue Nile.

Herodias brachyrhyncha Reichw. V. A. i. p. 389; Butler, Ibis, 1905, p. 372, 1908, p. 255.

Recorded by Heuglin from Kordofan and the White and Blue Niles. There are specimens in the Museum from the Sobat River.

Demigretta schistacea.

Ardea (*Lepterodias*) *schistacea* Hempr. & Ehr. Symb. Phys., Zool. ii. 1828, fol. i. pl. 6: Northern Red Sea.

Herodias schistacea Reichw. V. A. i. p. 387.

[C. & L. coll.] 2 Port Sudan Dec. & Apl. **R.S.**

One of these birds is in grey plumage changing to white, the other in almost complete white dress. This bird has a long tarsus, and is apparently quite distinct from *D. gularis* from the rest of Africa, which also does not appear ever to have a white phase. Nor do these birds seem to us to be the same as the Indian form (*Ardea asha* Sykes, P. Z. S. 1832, p. 157: Deccan), in which the grey phase is considerably paler. We do not think, however, that there are sufficient grounds to justify its separation from the genus *Demigretta*. We cannot say from present material whether this species has two dimorphic forms—a grey and a white—or whether one is the young of the other. Hemprich and Ehrenberg concluded that the white form was the young one, and this may prove to be the case; but what we have little doubt of is that, unlike the Australian Reef-Herons (*cf.* Mathews, Birds of Australia, iii. p. 454), these are both forms of the same species. We can trace no record of the true *D. gularis* (*Ardea gularis* Bosc, Actes de la Soc. d'Hist. Nat. Paris, i. 1792, p. 4, pl. 2: Senegal River) ever having occurred in the Sudan, the specimen labelled "Nile" (Sir F. Galton) mentioned in the British Museum Catalogue being an undoubted example of *D. schistacea*, and the older authors not having separated the two birds. This species appears to be an almost exclusively marine form, while *D. gularis* is also an inland form.

Melanophoyx ardesiaca.

Ardea ardesiaca Wagl. Syst. Av., Ardea, 1827, p. 189: Senegambia.

Melanophoyx ardesiaca Reichw. V. A. i. p. 373.

Recorded by Heuglin from the White Nile and Sobat River, and from Lado by Emin.

Ardeola ralloides.

Ardea ralloides Scopoli, Annus i. Hist. Nat. 1769, p. 88: Carniola.

Ardeola ralloides Reichw. V. A. i. p. 374.

Herodias ralloides Butler, Ibis, 1905, p. 372, 1908, p. 255, 1909, p. 89.

[C. & L. coll.] 1 Jebel Ahmed Agha, Jan. **U.N.**

Ardeola ibis.

Ardea ibis Linn. Syst. Nat. 10th ed. 1758, p. 144: Egypt.

Bubulcus ibis Reichw. V. A. i. p. 381.

Herodias bubulcus (Aud.); Butler, Ibis, 1905, p. 372, 1908, p. 255.

[B. coll.] 2 Khartoum July; 1 Malakal May, 1 mouth of Zeraf river May, 3 Upper Nile "summer" Oct. Nov. **U.N.**; 1 Wau Apl. **B.G.**

Extremely widely distributed.

Butorides atricapilla atricapilla.

Ardea atricapilla Afzelius, Kongl. Vet.-Akad. nya Handl. Stockh. xxv. 1804, p. 264: Sierra Leone.

Butorides atricapillus Reichw. V. A. i. p. 370; Butler, Ibis, 1905, p. 373, 1908, p. 255.

[B. coll.] 1 Sherif Yakub Oct. **B.N.**; 1 Kenisa May, **Mon.**

Generally distributed.

Butorides brevipes.

Ardea (Nycticorax) brevipes Hempr. & Ehr. Symb. Phys. Aves, i. 1823, fol. *m*, Note 2: "Habitat ad ripas Nili et ad Maris rubri littus."

Butorides brevipes Reichw. V. A. i. p. 372.

[B. coll.] 1 Port Sudan Apl. **R.S.**

This species takes the place of *B. a. atricapilla* on the shores of the Red Sea and on the Arabian coasts. It closely resembles that species, but is of a generally dingier coloration, the green on the back being almost obsolete, as also are the throat-markings. It may prove to be but a race of *B. atricapilla,* though the legs and feet seem to be in most cases shorter and stronger than in that bird.

Ixobrychus minutus minutus.

Ardea minuta Linn. Syst. Nat. 12th ed. i. 1766, p. 240: Switzerland.

Ardetta minuta Reichw. V. A. i. p. 366; Butler, Ibis, 1905, p. 373.

[B. coll.] 1 Gedaref Apl. 29, **Kas.**; 4 Khartoum Apl. 18–May 24; 2 Dueim May, **W.N.**

Widely distributed in winter, most noticeable at migration time.

Ixobrychus minutus payesi.

Ardea payesii Hartl. J. f. O. 1858, p. 42 (ex Verreaux): Casamanse, Senegal.

Ardetta payesi Reichw. V. A. i. p. 367.

[B. coll.] 1 Bahr el Jebel June, **U.N.**

The African representative of the Little Bittern, distinguished by its richer coloration, especially on the neck.

Ardeiralla sturmi.

Ardea sturmii Wagler, Syst. Av., Ardea, 1827, p. 191: Senegambia.

Ardetta sturmi Reichw. V. A. i. p. 368.

The African Dwarf Bittern has been recorded from eastern Kordofan and the Shilluk country by Heuglin. It ranges throughout Africa south and west of the Sudan.

Nycticorax nycticorax nycticorax.

Ardea nycticorax Linn. Syst. Nat. 10th ed. 1758, p. 142: Southern Europe.

Nycticorax nycticorax Reichw. V. A. i. p. 362.

Nycticorax griseus (Linn.); Butler, Ibis, 1905, p. 373.

[B. coll.] 1 Bahr el Jebel May, **U.N.**

Common.

Nycticorax leuconotus.

Ardea leuconotus Wagler, Syst. Av., Ardea, 1827, p. 189 : Senegambia.

Nycticorax leuconotus Reichw. V. A. i. p. 363.

Several times recorded from the Sudan, from both White and Blue Niles.

Botaurus stellaris stellaris.

Ardea stellaris Linn. Syst. Nat. 10th ed. 1758, p. 144 : Europe, restricted type-locality Sweden.

Botaurus stellaris Reichw. V. A. i. p. 364 ; Butler, Ibis, 1905, p. 373.

[B. coll.] 1 Khartoum Apl. 13.

The Bittern is not a regular winter visitor to the Sudan, but has occurred on several occasions.

Family SCOPIDÆ.

Scopus umbretta bannermani.

Scopus umbretta bannermani Claude Grant, Bull. B. O. C. xxxv. 1914, p. 27 : Mt. Leganisho, B.E.A.

Scopus umbretta apud Reichw. V. A. i. p. 353 ; Butler, Ibis, 1905, p. 377, 1908, p. 255, 1909, p. 89.

[B. coll.] 2 Raffali Feb. **B.G.**

[C. & L. coll.] 1 nr. Melut Jan. **U.N.**

Family BALÆNICIPITIDÆ.

Balæniceps rex.

Balæniceps rex Gould, P. Z. S. 1851, p. 1, pl. 35 : Upper White Nile ; Reichw. V. A. i. p. 357 ; Butler, Ibis, 1905, pp. 373–377, 1908, p. 255.

[B. coll.] 2 (pull.) Bahr el Ghazal Apl. 14.

The Whale-headed Stork occurs on the White Nile south of Lake No, and occasionally to the north of it, also on the Jur, Bahr el Ghazal, and Sobat. For a description of its habits, see Butler, Ibis, 1905, pp. 373–377.

Family Ciconiidæ.

Ciconia ciconia ciconia.

Ardea ciconia Linn. Syst. Nat. 10th ed. 1758, p. 142: Europe, Asia, and Africa, restricted type-locality Sweden.

Ciconia ciconia Reichw. V. A. i. p. 345.

Ciconia alba Bechst.; Butler, Ibis, 1905, p. 378.

The White Stork is a common winter visitor.

Ciconia nigra.

Ardea nigra Linn. Syst. Nat. 10th ed. 1758, p. 142: Northern Europe.

Ciconia nigra Reichw. V. A. i. p. 346; Butler, Ibis, 1905, p. 378, 1908, p. 255.

Also a winter visitor, but not so common as the White Stork.

Abdimia abdimi.

Ciconia abdimii Licht. Verz. Doubl. 1823, p. 76: Dongola, Sudan; Butler, Ibis, 1905, p. 378, 1908, p. 255.

Abdimia abdimi Reichw. V. A. i. p. 343.

[Chr. coll.] 1 Meridi Mch. **B.G.**

Dissoura episcopus microscelis.

Ciconia microscelis G. R. Gray, Gen. Birds, iii. 1848, p. 561, pl. 151.

Dissoura microscelis Reichw. V. A. i. p. 347.

Dissura episcopus apud Butler, Ibis, 1905, p. 379.

[B. coll.] 1 Kenisa May, **Mon.**

[C. & L. coll.] 1 nr. Melut, 1 nr. Meshra Zeraf Jan. **U.N.**

Reichenow (*l. c.*) has pointed out the difference between the Indian and African forms of the Woolly-necked Stork, and attaches Gray's non-descript name to the latter. Gray's figure appears to represent an African bird, though he nowhere states as much.

Ephippiorhynchus senegalensis.

Micteria senegalensis Shaw, Tr. Linn. Soc. v. 1798, p. 35, pl. 3: Senegal; Butler, Ibis, 1905, p. 379, 1908, p. 255.

Ephippiorhynchus senegalensis Reichw. V. A. i. p. 341.

[C. & L. coll.] 1 Kodok Jan. **U.N.**
[Chr. coll.] 1 (no original label).

Leptoptilus crumeniferus.

Ciconia crumenifera Less. Traité, 1831, p. 585 : Senegal.

Leptoptilus crumenifer Reichw. V. A. i. p. 338 ; Butler, Ibis, 1905, p. 381, 1908, p. 256.

Fairly common and widely distributed.

Anastomus lamelligerus.

Anastomus lamelligerus Temm. Pl. Col. v. 1823, pl. 236 : Africa ; Reichw. V. A. i. p. 335 ; Butler, Ibis, 1905, p. 381, 1908, p. 256.

[B. coll.] 2 Malakal May, **U.N.**
[C. & L. coll.] 1 Lake No Feb. **U.N.**

Ibis ibis.

Tantalus ibis Linn. Syst. Nat. 12th ed. i. 1766, p. 241 : Egypt.

Pseudotantalus ibis Reichw. V. A. i. p. 333 ; Butler, Ibis, 1905, p. 381.

The African Wood-Ibis is widely distributed. There happen to be no examples in the present collections.

Family PLATALEIDÆ.

Platalea leucorodia.

Platalea leucorodia Linn. Syst. Nat. 10th ed. 1758, p. 139 : Europe, restricted type-locality S. Sweden ; Reichw. V. A. i. p. 330 ; Butler, Ibis, 1908, p. 272.

Platalea alba.

Platalea alba Scopoli, Del. Flor. et Faun. Insubr. ii. 1786, p. 92 (ex Sonnerat, Luzon !): probably Cape of Good Hope : Reichw. V. A. i. p. 331 ; Butler, Ibis, 1905, p. 372.

Both the European and African Spoonbills are widely distributed in the Sudan, though the African does not extend to the northern portions of the country nor the European to the southern.

Family Plegadidæ.

Plegadis falcinellus.

Tantalus falcinellus Linn. Syst. Nat. 12th ed. i. 1766, p. 241 : Habitat in Austria, Italia.

Plegadis falcinellus Butler, Ibis, 1905, p. 372.

Plegadis autumnalis apud Reichw. V. A. i. p. 329.

[C. & L. coll.] 1 Meshra Zeraf Jan. **U.N.**

Threskiornis æthiopica.

Tantalus æthiopicus Lath. Ind. Orn. 1790, p. 706 : Æthiopia.

Ibis æthiopica Reichw. V. A. i. p. 321 ; Butler, Ibis, 1905, p. 371, 1908, p. 254.

[B. coll.] 2 Malakal May, **U.N.**

[C. & L. coll.] 1 40 miles south of Jebelein, **U.N.**

Comatibis eremita.

Upupa eremita Linn. Syst. Nat. 10th ed. 1758, p. 118 : Switzerland.

Geronticus eremita Reichw. V. A. i. p. 323.

Not common ; there is a specimen in the Museum from Suakin collected by Penton, and it is recorded from the Blue Nile by Flower.

Hagedashia hagedash nilotica.

Hagedashia hagedash nilotica Neum. Ornis, xiii. 1909, p. 193 : nr. Adis Abeba, Abyssinia.

Theristicus hagedash (Lath.) ; Reichw. V. A. i. p. 325.

Geronticus hagedash (Lath.) ; Butler, Ibis, 1905, p. 372, 1908, p. 254, 1909, p. 89.

[B. coll.] 1 Malakal May, 1 Upper Nile "summer," 1 Lake No May, **U.N.** ; 1 Raffali Feb. **B.G.**

[C. & L. coll.] 1 Senga Dec. **Sen.** ; 1 nr. Jebelein Jan., 1 Lake No Feb. **U.N.**

For a list of the races of the Hagedash Ibis, see Neumann, *op. cit.*, and Zedlitz, J. f. O. 1914, p. 640.

Family BALEARICIDÆ (*i. e.*, GRUIDÆ auct.).

Megalornis grus grus.

Ardea grus Linn. Syst. Nat. 10th ed. 1758, p. 141: Europe, restricted type-locality Sweden.

Grus grus Reichw. V. A. i. p. 261.

Grus communis Bechst.; Butler, Ibis, 1905, p. 394.

[C. & L. coll.] 1 Singa Dec. **Sen.**

A winter migrant in large numbers.

Anthropoides virgo.

Ardea virgo Linn. Syst. Nat. 10th ed. 1758, p. 141: Habitat in Oriente.

Anthropoides virgo Reichw. V. A. i. p. 263.

Grus virgo Butler, Ibis, 1905, p. 394.

[C. & L. coll.] 2 mouth of Sobat river Jan. **U.N.**

The Demoiselle Crane visits the northern Sudan in winter, but is not so abundant as the last species.

Balearica pavonina ceciliæ.

Balearica ceciliæ Mitchell, Abstr. P. Z. S. 1904, No. 10, p. 13: White Nile near Khartoum; Butler, Ibis, 1908, p. 260.

Balearica pavonina apud Butler, Ibis, 1905, p. 393.

[B. coll.] 1 (pull.) Senga Nov. **Sen.**; 1 Kaka June, **U.N.**; 1 (head and neck only) "Sudan."

[C. & L. coll.] 1 nr. Singa Dec. **Sen.**; 2 Kaka Jan., 1 Tonga Feb., 2 Kodok Mch. **U.N.**

Widely distributed, in places abundant. For the forms and distribution of the Crowned Crane, see Mitchell, P. Z. S. 1904, pp. 200–205.

Family OTIDIDÆ.

Otis (Eupodotis) arabs arabs.

Otis arabs Linn. Syst. Nat. 10th ed. 1758, p. 154: Habitat in Oriente; Reichw. V. A. i. p. 243 (part.).

[B. coll.] 1 Gedaref Apl. **Kas.** (head and neck only).

[C. & L. coll.] 1 Sinkat Mch. **R.S.** (head and wing only).

Otis (Eupodotis) arabs stieberi.

Otis arabs stieberi Neum. J. f. O. 1907, p. 307: Kusseri, Shari river.

[B. coll.] 1 Minawi Estate, El Damer, **Ber.**

[C. & L. coll.] 1 Melut Jan., 1 Lake No Feb., 1 Bahr el Zeraf Feb. **U.N.**

This race, separated by Neumann on account of the colour of the crown, which is gold and black, and not grey and black, seems to extend from the Nile valley westwards. There is a specimen of this race in the Museum from 30 miles S.W. of Rabat, Morocco. The El Damer bird is most certainly of this race, while the Gedaref bird belongs equally certainly to the other. Southern birds, while nearer to this race than to *O. a. arabs*, are as a rule darker on the crown than northern birds, as is exemplified by the specimen from the Bahr el Zeraf and by one or two others in the Museum collection. The range of *O. a. arabs* is from southern Arabia and the Red Sea Coast to Eritrea and Kassala.

The range of *O. a. stieberi* is from the Nile Valley to western Morocco and south to the Shari River.

Otis arabs is the commonest of the large Bustards of the Sudan. The specimen recorded by Ogilvie-Grant (Ibis, 1902, p. 453) as *Eupodotis kori*, which was collected by Hawker at Renk, proves on further examination to be an example of *O. a. stieberi.*

Otis (Neotis) cafra denhami.

Otis denhami Childr. in Denh. & Clapp. Trav. ii. 1826, p. 199: Interior of N. W. Africa; Reichw. V. A. i. p. 245: Butler, Ibis, 1908, p. 260.

Confined to the western side of the Sudan, Kordofan, and the western Bahr-el-Ghazal whence it ranges across to Lake Chad. There are very few examples of this fine Bustard in collections. The largest specimen in the British Museum, one obtained by Petherick in Kordofan, has a wing of approximately 630 mm. The large size of the bill is at once evident when compared with typical *O. c. cafra*, though in coloration they are not unlike.

Otis (Neotis) burchelli.

Eupodotis burchellii Heugl. J. f. O. 1867, p. 301 : Jebel Dul, south of Sennar.

Otis burchelli Reichw. V. A. i. p. 246.

Nothing further has been discovered about this species since Heuglin's original description, or have any other specimens come to light. There is an excellent figure in Heuglin's Orn. Nordost-Afr. pl. xxxi. of a very fine-looking Bustard of the size of *O. cafra,* with a black face, throat, and crop, and a red back to the neck.

Otis (Lissotis ?) nuba.

Otis nuba Cretzschmar, Atlas, 1826, p. 1, pl. i. : Nubia ; Reichw. V. A. i. p. 247 ; Butler, Ibis, 1905, p. 391.

Mr. Butler records this Bustard from Kordofan, west of Omdurman, and from near "Summit" on the Red Sea Railway.

Otis (Lissotis) melanogaster.

Otis melanogaster Rüpp. Neue Wirb. 1835, p. 16, pl. vii. : Lake Tsana ; Reichw. V. A. i. p. 256.

Lissotis lovati Grant ; Butler, Ibis, 1905, p. 391 (part.), 1908, p. 260.

[B. coll.] 1 Malakal May, 1 Khor Filus June, **U.N.** ; 1 Mongalla May, **Mon.** ; 1 Rejaf Feb. **L.E.**

[C. & L. coll.] 1 nr. Tonga, 1 nr. Lake No, 1 between Zeraf and Sobat Rivers, 1 lat. 9½° N., long. 31° E. Feb. **U.N.**

Ogilvie-Grant in 'The Ibis,' 1902, pp. 453–457, renamed this bird *Lissotis lovati,* as was pointed out by Oberholser, P. U.S. Nat. Mus. xxviii. 1905, p. 836. Both, however, agreed that there were two species, one with much white on the wings and one with little, and Oberholser named the latter *Lissotis notophila*, fixing Durban as the type-locality. On examining the material in the Museum, however, we found that a series of these Bustards from Natal and elsewhere collected by Claude Grant, and which Mr. Ogilvie-Grant had not seen when writing his paper, had since arrived in the Museum. These show at once that the South African form has also the large amount of white on the wing, and is, as far as we can see, inseparable from true *Otis melanogaster* Rüpp. We must therefore agree with Reichenow that there is only one species, and must place *L. lovati* O.-Grant and *L. notophila* Oberholser as synonyms. The only birds which we can find which do not have the large amount of white on the wing are undoubtedly not fully adult, with only two exceptions, both from Nyasaland. There is, of course, some slight variation in the amount of white in adults from other parts of Africa, but nothing like the amount depicted by Ogilvie-Grant, except for these two Nyasaland specimens, one of which may very well have been the actual specimen figured by him. Further material from that country therefore will be of interest, but, should this difference prove consistent, the race will require a new name.

Otis (Lissotis) hartlaubi.

Otis hartlaubi Heuglin, J. f. O. 1863, p. 10: East Sennar; Reichw. V. A. i. p. 259.

[B. coll.] 1 Gedaref May, **Kas.**

[C. & L. coll.] 1 Kaka, 1 Melut, 1 White Nile lat. 10½° N. Jan. **U.N.**

Otis (Trachelotis) senegalensis senegalensis.

Otis senegalensis Vieill. Enc. Méthod. i. 1820, p. 333: Senegal; Reichw. V. A. i. p. 250; Butler, Ibis, 1905, p. 390.

This Bustard ranges from Senegal to the Nile Valley, being most frequent in the red sandstone country of Kordofan. This is the only specimen in the Museum from the Sudan, and it appears to be even redder on the back and with finer vermiculations than the examples from Senegal and Lake Chad. Whether this is individual or not we cannot say.

Family Burhinidæ.

Œdicnemus œdicnemus œdicnemus.

Charadrius œdicnemus Linn. Syst. Nat. 10th ed. 1758, p. 151: England.

[C. & L. coll.] 1 Sinkat Mch. **R.S.**

There are in the Museum four Stone-Curlews from north-eastern Africa. They are all in worn plumage, and at first sight they all appear to differ considerably. There are two from the Red Sea Province, one from Lake Zwai in Abyssinia, and one from Sugsoda in Somaliland. These birds Dr. Hartert was kind enough to examine, and we agree with his conclusions. The Somaliland bird is so pale and small, wing 214 mm. (very worn), that it may even prove to be a resident race in Somaliland. The other three Dr. Hartert considers must be regarded as more or less aberrant examples of the typical race. A larger series of these birds from Africa would be of considerable interest.

Œdicnemus senegalensis.

Œdicnemus senegalensis Swains. Bds. of W. Africa, ii. 1837, p. 228: Senegal; Reichw. V. A. i. p. 197; Butler, Ibis, 1905, p. 398, 1908, p. 262, 1909, p. 90.

[B. coll.] 1 Sherif Yakub June, **B.N.**; 1 Roseires May, **Sen.**; 1 Kadaru Jan. **Kh.**; 1 Lake No May, 1 Hillet Nuer May, **U N.**; 1 Shambé Jan. **Mon.**; 1 Chak Chak, 1 Raffali Feb. **B.G.**

[C. & L. coll.] 1 Kamisa Dec. **Sen.**; 2 Tonga Feb. Mch., 2 near Lake No Feb., 1 White Nile lat. 9½° N. long. 31° E. Feb. **U.N.**

Very widely distributed.

Œdicnemus capensis capensis.

Œdicnemus capensis Licht. Verz. Doubl. 1823, p. 69: Cape of Good Hope.

Œdicnemus capensis capensis Claude Grant, Ibis, 1915, p. 63.

[B. coll.] 1 Wau Apl. **B.G.**

We agree with Claude Grant, *op. cit.*, that East African specimens of *Œ. capensis* cannot be separated from the typical form. This single example from the Bahr el Ghazal we are also unable to separate from that form. The dark and heavily marked back and breast at once distinguish it from *Œ. c. affinis*. This is, of course, considerable extension of range of *Œ. c. capensis*.

Œdicnemus capensis affinis.

Œdicnemus affinis Rüppell, Mus. Senck. ii. 1837, p. 210: Kordofan; Butler, Ibis, 1908, p 262, 1909, p. 90.

[B. coll.] 1 Jebelein Jan. **W.N.**; 1 Lake No Jan. **U.N.**
[C. & L. coll.] 2 nr. Tonga Feb., 1 White Nile lat. 10° N. Jan. **U.N.**

These birds are probably typical *Œ. c. affinis*, though we have no Kordofan examples with which to compare them. Claude Grant, Ibis, 1915, p. 63, unites with this form the Somaliland birds, but we are by no means certain that this is correct, the latter appearing to us to be lighter and more finely striped on the back, while on the underside the striping is continued further down the breast and the ground-colour is not so white. Possibly the Somaliland form is the same as that described by Zedlitz from Dahlak Island in the Red Sea under the name of *Œ. c. ehrenbergi* (O. M. 1910, p. 9).

Family Dromadidæ.

Dromas ardeola.

Dromas ardeola Payk. Vet.-Ak. Handl. Stockh. xxvi. 1805, p. 182, pl. 8: India; Reichw. V. A. i. p. 202.

[B. coll.] 2 Port Sudan May, **R.S.**

Family Glareolidæ.

Glareola pratincola limbata?

Glareola limbata Rüpp. Syst. Uebers. Vög. Nordost-Afr. 1845, p. 113: Djeddah = Jiddah, Red Sea coast of Arabia.

Glareola pratincola apud Butler, Ibis, 1905, p. 400.

[B. coll.] 6 Khartoum Dec., Feb., Apl. 18.
[C. & L. coll.] 2 Bahr el Zeraf Feb. **U.N.**

We are very uncertain as to whether these Pratincoles are really *G. p. limbata*—or, indeed, as to whether that race can really be separated from *G. p. pratincola* at all. Dr. Hartert gives a review of the races in Nov. Zool. xxiii. pp. 89–91, and says that this race is resident in Africa and is not a winter migrant. Unfortunately all our specimens happen to be winter birds, and Mr. Butler looked on it also as only a winter migrant. We have, therefore, no summer birds from within our limits to compare with those from elsewhere. As to coloration we can see very little difference indeed between N.W. African, N.E. African, and European birds, though some of the N.W. African examples are certainly darker and somewhat approach *G. p. fülleborni* of south-eastern Africa, which is undoubtedly a resident race.

Glareola nordmanni.

Glareola nordmanni Fischer, Bull. Soc. Imp. Nat. Moscou, xv. 1842, p. 314 : S. Russia.

Glareola melanoptera auct., Reichw. V. A. i. p. 145.

[B. coll.] 1 Mongalla Oct. **Mon.**

A winter migrant to tropical and South Africa.

Glareola (Galachrysia) nuchalis nuchalis.

Glareola nuchalis Gray, P. Z. S. 1849, p. 63, pl. 9 : 5th Cataract of the Nile.

This bird, only known from the type, was secured by Galton at the 5th Cataract near Berber, and the British Museum Catalogue of Birds is therefore wrong in giving the Upper White Nile as its habitat. From an examination of the material in the Museum, it appears that the white and red-necked forms of this bird intergrade, and they are therefore best considered as one species.

Glareola (Galachrysia) nuchalis emini.

Glareola emini Shelley, P. Z. S. 1888, p. 49 : Foda, Wadelai.

This race appears just to enter the southern limits of the Anglo-Egyptian Sudan.

The races of *G. nuchalis* appear to be :—

1. G. N. NUCHALIS Gray, *op. cit.*

   Only known from the 5th Cataract. A small race with a wing of 140 mm., and with white borders to the bases of the outer webs of the secondaries. Neck-band white.

2. G. N. EMINI Shelley, *op. cit.*

Type from Wadelai and ranging thence to Abyssinia, to the Welle and Ubanghi rivers, the hinterland of Cameroon, and south through the Belgian Congo to the Zambesi. Possibly a migrant over part of its range. A larger race, wing average 150 mm. No white on the outer webs of the secondaries. Neck-band white.

3. G. N. MARCHEI.

Glareola nuchalis var. *marchei* Oust. Bull. Soc. Philom. 7th series, i. 1877, pp. 104, 105: Ogowe River, Gaboon.

This may possibly prove to be identical with *G. n. emini*, but Oustalet's measurements are very small, wing only 125 mm. We have no specimens from that locality. Neck-band white, no white on the outer webs of the secondaries.

4. GLAREOLA NUCHALIS LIBERIÆ.

Glareola nuchalis liberiæ Schleg. Notes Leyden Mus. 1881, p. 58: Liberia.

Similar to *G. n. emini*, but with the neck-band as a rule rich chestnut. There are, however, specimens before us from the Gold Coast with an intermediate light rusty-coloured neck-band, and Reichenow mentions that in Cameroon Conrau found both forms together.

This race extends from Cameroon to Liberia.

In the O. M. 1908, p. 191, Reichenow has described as *Glareola antænia* a Pratincole from the Ituri district similar to *G. nuchalis*, but with no neck-band at all. The only specimens we can find without neck-bands are either young birds or skins in which the neck has been damaged in the skinning. Should it prove to be a good race, it must occupy a restricted area, as we have specimens of *G. n. emini* from all sides of it.

The group of Pratincoles to which this species belongs is frequently separated from *Glareola* under the name *Galactochrysea*—or, as originally spelt, *Galachrysia*.

Family Cursoriidæ.

Ortyxelos meiffreni.

Turnix meiffreni Vieill. Nouv. Dict. xxxv. 1818, p. 49: Senegal.

Ortyxelos meiffreni Reichw. V. A. i. p. 162; Butler, Ibis, 1905, p. 386.

[B. coll.] 1 El Obeid Mch. **Kor.**

The specimens in the Museum from Senegal are hardly in sufficiently good order for comparison, but it may be worthy of remark that of five from the neighbourhood of Lake Chad, while no two of them are alike, all differ considerably from Kordofan examples.

Pluvianus ægyptius.

Charadrius ægyptius Linn. Syst. Nat. 10th ed. 1758, p. 150: Egypt.

Pluvianus ægyptius Reichw. V. A. i. p. 150; Butler, Ibis, 1905, p. 399, 1908, p. 263.

[B. coll.] 1 Blue Nile Apl.; 1 Chak Chak Feb. **B.G.**
[C. & L. coll.] 1 White Nile lat. 14° N. Jan. **W.N.**
[Chr. coll.] 2 Wau July, Aug. **B.G.**

Cursorius gallicus gallicus.

Charadrius gallicus Gmel. Syst. Nat. i. pt. 2, 1789, p. 692: France.

Cursorius gallicus Butler, Ibis, 1905, p. 400.

[B. coll.] 1 Shendi Mch. **Ber.**; 6 Khartoum Jan. Feb. Nov., 1 Omdurman Apl. **Kh.**
[C. & L. coll.] 1 nr. Sennar Jan. **Sen.**

These Coursers all seem indistinguishable from typical examples of *C. g. gallicus*, nor can we recognise *C. g. kordofanensis* Wettstein, Anz. K. Akad. Wien, 1916, no. 13, p. 131: El Obeid, as being in any way distinct. The character of the yellow-washed chin and under tail-coverts seems to occur in many specimens from the shores of the Mediterranean, and, as a matter of fact, a single bird before us from El Obeid is somewhat light-coloured in those respects.

Cursorius temmincki.

Cursorius temmincki Swains. Zool. Illustr. ii. 1822, pl. 106: Senegal; Reichw. V. A. i. p. 155.

This Courser has been recorded, under the name of *Cursorius senegalensis*, from Sennar and easterly Kordofan by Heuglin. We know of no recent occurrences.

Rhinoptilus chalcopterus chalcopterus.

Cursorius chalcopterus Temm. Pl. Col. livr. 50, 1824, pl. 298: Senegal.

Rhinoptilus chalcopterus Reichw. V. A. i. p. 157; Butler, Ibis, 1905, p. 400, 1908, p. 263.

[B. coll.] 2 Pongo River Mch. **B.G.**

[C. & L. coll.] 2 White Nile lat. 9½ N. long. 30° 40′ E. Feb. **U.N.**

Neumann has separated the southern race of this bird, owing to its alleged darker colour, as *R. c. obscurus* (O. M. 1910, p. 11). It appears to us to be separable only with great difficulty from Sudanese examples. *Rhinoptilus albofasciatus* (Sharpe, Bull. B. O. C. iii. 1893, p. xiv: South Africa) we regard as the young of *R. chalcopterus*—at least all the examples of this form before us, whatever their locality, are immature birds.

Rhinoptilus cinctus cinctus.

Hemerodromus (Cursorius) cinctus Heugl. J. f. O. 1863, p. 25: Gondokoro.

Rhinoptilus cinctus cinctus Zedlitz, J. f. O. 1914, p. 624.

This species has not apparently been obtained in the Anglo-Egyptian Sudan since Heuglin's time. Zedlitz (*op. cit.*) has given a revision of the races.

Family Jacanidæ.

Actophilus africanus.

Parra africana Gmelin, Syst. Nat. i. pt. 2, 1789, p. 709: Africa, restricted type-locality, Abyssinia (*cf.* Claude Grant, Ibis, 1915, p. 59).

Actophilus africanus Reichw. V. A. i. p. 267.

Phyllopezus africanus Butler, Ibis, 1905, p. 394, 1908, p. 261.

[B. coll.] 1 Meshra Rôm Feb., 3 Renk May, 1 Lake No Mch. **U.N.** ; 1 Mongalla "summer," **Mon.** ; 1 Meshra el Rek Mch. **B.G.**

[C. & L. coll.] 1 Jebelein Jan., 2 Lake No Feb. **U.N.**

[Chr. coll.] 1 Wau July, **B.G.**

Microparra capensis.

Parra capensis A. Smith, Ill. Zool. S. Afr., Birds, 1839, pl. 32 : Algoa Bay.

Microparra capensis Reichw. V. A. i. p. 270.

[C. & L. coll.] 1 mouth of Zeraf River Mch. **U.N.**

Previously obtained within our limits by Hawker at Fashoda, the only other Sudanese record known to us.

Family SCOLOPACIDÆ.

Gallinago gallinago gallinago.

Scolopax gallinago Linn. Syst. Nat. 10th ed. 1758, p. 147 : Europe, restricted type-locality Sweden.

Gallinago gallinago Reichw. V. A. i. p. 237.

Gallinago cœlestis (Frenz.) ; Butler, Ibis, 1905, p. 398, 1908, p. 262.

[C. &. L. coll.] 1 Taufikia Jan. **U.N.**

The Common Snipe is widely distributed in winter, never in very large numbers together (*A. L. B.*).

Gallinago nigripennis.

Gallinago nigripennis Bp. Icon. Faun. Ital., Ucc. 1832, p. 4 of text to pl. 43 : Cape.

The Ethiopian Snipe is recorded from Lado by Emin.

Gallinago media.

Scolopax media Latham, Gen. Synops. Suppl. i. 1787, p. 292 : England.

[B. coll.] 4 Lado Apl. 15–18, **L.E.**

Limnocryptes gallinula.

Scolopax gallinula Linn. Syst. Nat. 12th ed. i. 1766, p. 244: France.

Gallinago gallinula Butler, Ibis, 1905, p. 398, 1908, p. 262.

[B. coll.] 1 Kawa Nov. **W.N.**

The Jack-Snipe is not at all common.

Canutus canutus canutus.

Tringa canutus Linn. Syst. Nat. 10th ed. 1758, p. 149: Europe, restricted type-locality Sweden; Reichw. V. A. i. p. 229.

The Knot is recorded from Khartoum, Sennar, and the Blue Nile by Vierthaler. There are no recent records.

Pisobia minuta minuta.

Tringa minuta Leisler, Nachtr. zu Bechst. Naturg. Deutschl. 1812, p. 74: Hanau, Germany; Reichw. V. A. i. p. 233; Butler, Ibis, 1905, p. 396.

[B. coll.] 1 Khartoum Dec.

[C. & L. coll.] 1 nr. Senga Dec. **Sen.**; 1 Hassania Island Jan., 1 White Nile lat. 14° N. Jan. **W.N.**; 1 Renk Mch. **U.N.**

The Little Stint is abundant in winter.

Pisobia temmincki.

Tringa temminckii Leisler, Nachtr. zu Bechst. Naturg. Deutschl. 1812, p. 78: Hanau, Germany; Reichw. V. A. i. p. 234.

[C. & L. coll.] 1 Kosti Mch. **W.N.**

Temminck's Stint has previously been recorded from Kordofan by Petherick, and from Kordofan and the White Nile by Heuglin.

Pelidna alpina alpina.

Tringa alpina Linn. Syst. Nat. 10th ed. 1758, p. 149: Lapland; Reichw. V. A. i. p. 229.

The Dunlin is recorded by Heuglin from Nubia, Sennar, Kordofan, Lake Tsana, and Suakin. These records are ascribed in Reichenow, V. A. i. p. 229, to the British Museum, the name "Heuglin" having been accidentally omitted.

Erolia ferruginea ferruginea.

Tringa ferruginea Brünnich, Orn. Boreal. 1764, p. 53: Iceland.

Tringa subarquata (Güld.); Reichw. V. A. i. p. 230; Butler, Ibis, 1905, p. 396.

[B. coll.] 1 Dueim May, **W.N.**

The Curlew-Sandpiper is abundant along the northern parts of the Blue and White Niles in winter (*A. L. B.*).

Crocethia alba alba.

Trynga alba Vroeg, Cat. Adumb. 1764 (*cf.* British Birds, ix. p. 8; page and locality omitted).

Calidris arenaria (Linn.); Reichw. V. A. i. p. 227.

Mr. Butler records only one occurrence of the Sanderling, a party of three at Khartoum, one of which was shot. No other records are known to us.

Philomachus pugnax.

Tringa pugnax Linn. Syst. Nat. 10th ed. 1758, p. 148: Europe; restricted type-locality Sweden.

Totanus pugnax Reichw. V. A. i. p. 216.

Pavoncella pugnax Butler, Ibis, 1905, p. 397, 1908, p. 262, 1909, p. 405.

[B. coll.] 4 Khartoum Jan. Feb. Oct.; 1 Dueim Nov. **W.N.**

[C. & L. coll.] 5 near Senga Dec. **Sen.**

The Ruff is abundant in winter.

Totanus totanus.

Scolopax totanus Linn. Syst. Nat. 10th ed. 1758, p. 145: Europe, restricted type-locality Sweden.

Totanus totanus Reichw. V. A. i. p. 220.

Totanus calidris (Linn.); Butler, Ibis, 1905, p. 397.

The Redshank is a winter visitor, but not common.

Totanus (Iliornis) stagnatilis stagnatilis.

Totanus stagnatilis Bechst. Orn. Taschenb. ii. 1803, p. 292 : Germany; Reichw. V. A. i. p. 220; Butler, Ibis, 1905, p. 397, 1908, p. 262.

[C. & L. coll.] 3 nr. Senga Dec. **Sen.**; 1 Renk Mch. **U.N.**

The Marsh-Sandpiper is tolerably common in winter.

Totanus (Glottis) nebularius nebularius.

Scolopax nebularius Gunnerus in Leem, Beskr. Finm. Lapp. 1767, p. 251 : Norway.

Totanus littoreus (Linn.): Reichw. V. A. i. p. 217.

Totanus canescens (Gm.); Butler, Ibis, 1905, p. 397.

[B. coll.] 1 Roseires Apl. 19, **Sen.**; 2 Khartoum Apl. 9, Dec.

[C. & L. coll.] 1 Kosti Jan. **W.N.**

The Greenshank is a common winter migrant.

Tringa ochropus ochropus.

Tringa ocrophus Linn. Syst. Nat. 10th ed. 1758, p. 149 : Europe, restricted type-locality Sweden.

Totanus ochropus Reichw. V. A. i. p. 222; Butler, Ibis, 1905, p. 397, 1908, p. 262.

[C. & L. coll.] 1 Kamisa Dec. **Sen.**

Tolerably common in winter. An eastern race of the Green Sandpiper has been distinguished by Mathews, Austr. Av. Rec. i. 1913, p. 188 : Assam. The distinction is denied by Dr. Hartert and Miss Jackson, Ibis, 1915, p. 534. It seems best, however, to name the western race trinomially for the time being.

Rhyacophilus glareola glareola.

Tringa glareola Linn. Syst. Nat. 10th ed. 1758, p. 149 : Europe, restricted type-locality Sweden.

Totanus glareola Reichw. V. A. i. p. 222; Butler, Ibis, 1905, p. 397, 1908, p. 405.

The Wood-Sandpiper is fairly common, like the last species.

Actitis hypoleuca.

Tringa hypoleucos Linn. Syst. Nat. 10th ed. 1758, p. 149: Europe, restricted type-locality Sweden.

Tringoides hypoleucos Reichw. V. A. i. p. 224.

Totanus hypoleucus Butler, Ibis, 1905, p. 397, 1908, p. 262, 1909, pp. 90, 405.

[Chr. coll.] 2 Meridi Jan. Feb. **B.G.**; 1 Yei Nov. **L.E.**

The Common Sandpiper is found in winter wherever there is water.

Limosa limosa limosa.

Scolopax limosa Linn. Syst. Nat. 10th ed. 1758, p. 147: Europe, restricted type-locality Sweden.

Limosa limosa Reichw. V. A. i. p. 213.

Limosa ægocephala (Linn.); Butler, Ibis, 1905, p. 397.

[B. coll.] 1 Omdurman Nov. **Kh.**

[C. & L. coll.] 2 White Nile lat. 15° N. **W.N.**

The Black-tailed Godwit is sometimes very abundant in winter.

Limosa (Vetola) lapponica lapponica.

Scolopax lapponica Linn. Syst. Nat. 10th ed. 1758, p. 147: Lapland.

Limosa lapponica Reichw. V. A. i. p. 212.

The Bar-tailed Godwit is recorded by Brehm from "Nubia," but there are no definite records nearer than "Red Sea coast" given by Heuglin.

Numenius arquata arquata.

Scolopax arquata Linn. Syst. Nat. 10th ed. 1758, p. 145: Europe, restricted type-locality Sweden.

Numenius arquatus Reichw. V. A. i. p. 209; Butler, Ibis, 1905, p. 397.

[B. coll.] 1 Mongalla "July–Sept." **Mon.**

Numenius (Phæopus) phæopus phæopus.

Scolopax phæopus Linn. Syst. Nat. 10th ed. 1758, p. 146: Europe, restricted type-locality Sweden.

Numenius phæopus Reichw. V. A. i. p. 210; Butler, Ibis, 1905, p. 397.

Both the Curlew and Whimbrel occur fairly commonly in winter and spring.

Family Rostratulidæ.

Rostratula bengalensis.

Rallus benghalensis Linn. Syst. Nat. 10th ed. 1758, p. 153 : Asia.

Rostratula bengalensis Reichw. V. A. i. p. 237.

Rhynchæa capensis (Linn.) ; Butler, Ibis, 1905, p. 398.

Not a common bird in the Sudan.

Family Recurvirostridæ.

Recurvirostra avosetta.

Recurvirostra avosetta Linn. Syst. Nat. 10th ed. 1758, p. 151 : Öland.

Recurvirostra avocetta Reichw. V. A. i. p. 206; Butler, Ibis, 1905, p. 398.

The Avocet is scarce in the Sudan, though to be found on the lower Blue and White Niles and northwards.

Himantopus himantopus.

Charadrius himantopus Linn. Syst. Nat. 10th ed. 1758, p. 151 : Southern Europe.

Himantopus himantopus Reichw. V. A. i. p. 207.

Himantopus candidus Bonn. ; Butler, Ibis, 1905, p. 398.

[C. & L. coll.] 1 Tonga Feb. **U.N.**

The Stilt is common and widely distributed.

Two other Waders which might be expected to occur in the Sudan, but of which there is as yet no definite record, are the Terek Sandpiper, *Terekia cinerea*, and the Spotted Redshank, *Totanus* (*Erythroscelus*) *fuscus*. Both have occurred on the shores of the Red Sea to the south of Port Sudan.

Family CHARADRIIDÆ.

Squatarola squatarola squatarola.

Tringa squatarola Linn. Syst. Nat. 10th ed. 1758, p. 149: Europe, restricted type-locality Sweden.

Squatarola squatarola Reichw. V. A. i. p. 163.

The Grey Plover is recorded from "Nubia" by Hemprich and Ehrenberg, from Suakin by Heuglin, and from Kordofan by Petherick.

Pluvialis dominicus fulvus.

Charadrius fulvus Gmelin, Syst. Nat. i. pt. 2, 1789, p. 687: Tahiti; Butler, Ibis, 1908, p. 261.

Charadrius dominicus fulvus Reichw. V. A. i. p. 166.

In Mr. Butler's notes occurs the following:—"I once saw one of these Golden Plovers (with grey axillaries) being carried about the streets of Khartoum for sale." It has been recorded from Abyssinia by Hemprich and Ehrenberg, and from Somaliland by Revoil.

Charadrius hiaticula tundræ.

Ægialitis hiaticola tundræ P. R. Lowe, Bull. B. O. C. xxxvi. 1915, p. 7: Yenesay Valley, Siberia.

[B. coll.] 1 Khartoum Dec.

There are only three specimens of the Ringed Plover from the Sudan before us, but we are inclined to assign them, as well as nearly all the examples from the east coast and from the interior of Africa, to this smaller and darker race. The larger race seems to be the chief form found on the west coast.

Charadrius dubius curonicus.

Charadrius curonicus Gmelin, Syst. Nat. i. pt. 2, 1789, p. 692: "Curonia," *i.e.* Courland.

Charadrius dubius curonicus Hartert & Jackson, Ibis, 1915, p. 532.

[B. coll.] 1 Khartoum Feb.

[C. & L. coll.] 1 Kamisa Dec. **Sen.**; 1 Kosti Mch. **W.N.**; 1 Kodok Mch. **U.N.**

The Little Ringed Plover is widely distributed in winter.

Charadrius (Leucopolius) alexandrinus alexandrinus.

Charadrius alexandrinus Linn. Syst. Nat. 10th ed. 1758, p. 150: Egypt.

Ægialitis cantiana (Lath.); Butler, Ibis, 1908, p. 262.

Mr. Butler records Kentish Plovers as abundant at Khartoum in winter, but unfortunately we have no examples at all from the Nile valley. We expect, however, that they would all be of the typical race.

Charadrius (Leucopolius) alexandrinus seebohmi.

Charadrius alexandrinus seebohmi Hartert & Jackson, Ibis, 1915, p. 529 (nom. nov. pro *Charadrius cantianus minutus* Seebohm, Geogr. Distr. Charadriidæ, 1887, p. 169: Southern shores of Red Sea).

[C. & L. coll.] 1 Port Sudan, 14 Apl. **R.S.**

This specimen, a male, we believe to be nearest to the above race, though it is slightly large for it, wing 106·5, culmen 15·5 mm. It seems to be somewhat intermediate between *C. a. alexandrinus* and *C. a. seebohmi*. A nest of three eggs, half-incubated, belonged to it.

Charadrius (Helenægialus) pecuarius.

Charadrius pecuarius Temm. Pl. Col. livr. 31, 1823, pl. 183: Cape of Good Hope.

Charadrius varius Vieill. nec Linn., Reichw. V. A. i. p. 171.

Kittlitz's Sand-Plover is recorded from Khartoum by Mr. Butler and from a number of other localities in the Sudan by other authors.

Charadrius (Afroxyechus) tricollaris.

Charadrius tricollaris Vieill. Nouv. Dict. d'Hist. Nat. xxvii. 1818, p. 147: Africa, restricted type-locality Cape Town (*cf.* Claude Grant, Ibis, 1915, p. 57); Reichw. V. A. i. p. 176.

The Three-banded Plover is recorded by Heuglin from Gallabat.

Charadrius (Eupoda) asiaticus.

Charadrius asiaticus Pallas, Reise Russ. Reichs, ii. 1773, p. 715: S. Tartary; Reichw. V. A. i. p. 167; Butler, Ibis, 1905, p. 396, 1908, p. 261.

[B. coll.] 3 Khartoum Nov. & Dec.; 1 Ajum Jan. **B.G.**
[C. & L. coll.] 1 White Nile lat. 15° N. **W.N.**; 1 Taufikia Jan. **U.N.**

The Caspian Sand-Plover is abundant and widely distributed in winter.

Charadrius (Pagoa) leschenaulti.

Charadrius leschenaulti Lesson, Dict. Sci. Nat. xlii. 1826 (édition Levrault), p. 36: Pondicherry.

Charadrius geoffroyi Wagler; Reichw. V. A. i. p. 166 et auct.

Ægialitis geoffroyi Butler, Ibis, 1909, p. 405.

The Large Sand-Plover is recorded from "Nubia" by Hemprich and Ehrenberg. Mr. Butler noticed this species at Port Sudan, at which locality some birds remained till as late a date as May 26th.

Charadrius (Eudromias) morinellus

Charadrius morinella Linn. Syst. Nat. 10th ed. 1758, p. 150: Europe, restricted type-locality Sweden.

A specimen is reported by Vierthaler from the Blue Nile, but it seems a very uncertain record. There seems, however, no reason why the Dotterel should not occur in the country in winter.

There are two other Plovers as yet unrecorded from the Sudan which might be expected to occur. One, the Golden Plover, *Pluvialis apricarius* Linn., has been found as far south as Somaliland and Aden, and the other, the western race of the Mongolian Sand-Dotterel, *Charadrius* (*Cirrepidesmus*) *mongolus atrifrons* Wagl., has been recorded from the Red Sea coast to the south of our limits.

Family VANELLIDÆ.

Stephanibyx melanopterus melanopterus.

Charadrius melanopterus Cretzschm. Atlas, 1826, p. 46, pl. 31: Djedda, Arabia.

Stephanibyx melanopterus Reichw. V. A. i. p. 179.

Rüppell records a specimen of this bird from "Nubia." We should not regard it as admissible to the Sudanese list without further confirmation.

Xiphidiopterus albiceps.

Vanellus albiceps Gould, P. Z. S. 1834, p. 45: Quorra River, *i. e.* Niger.

Xiphidiopterus albiceps Reichw. V. A. i. p. 192; Butler, Ibis, 1909, p. 90.

[B. coll.] 1 Kojali Mch. **B.G.**

Apparently a rare bird.

Afribyx senegallus senegallus.

Parra senegallus Linn. Syst. Nat. 12th ed. i. 1766, p. 259: Senegal.

Lobivanellus senegallus Reichw. V. A. i. p. 193; Butler, Ibis, 1905, p. 394, 1908, p. 261.

[B. coll.] 2 Malakal May, **U.N.**; 1 near Bor Jan. **Mon.**

[C. & L. coll.] 6 near Tonga Feb. **U.N.**

[Chr. coll.] 1 Yei Dec. **L.E.**

Common. Neumann (O. M. 1914, p. 9) has described as *A. s. major* a race from the highlands of Abyssinia, which differs from the typical form by its larger size, wing 238–258 mm. against 210–230.

Our own specimens measure 220–235, the average being 230.

Sarciophorus tectus.

Charadrius tectus Bodd. Tabl. Pl. Enl. 1783, p. 51: Senegal.

Sarciophorus tectus Reichw. V. A. i. p. 189; Butler, Ibis, 1905, p. 395, 1908, p. 261, 1909, p. 90.

[B. coll.] 1 Sherif Yakub Apl. **B.N.**; 1 Tawela Dec. **U.N.**; 2 Mongalla "summer," **Mon.**

[C. & L. coll.] 2 Kamisa Dec. **Sen.**; 1 Jebelein, 1 mouth of Sobat River Jan. **U.N.**

Found throughout the Sudan.

Hoplopterus spinosus.

Charadrius spinosus Linn. Syst. Nat. 10th ed. 1758, p. 151: Egypt.

Hoplopterus spinosus Reichw. V. A. i. p. 186; Butler, Ibis, 1905, p. 395, 1908, p. 261, 1909, p. 90.

[B. coll.] 1 Malakal May, **U.N.**; 1 Shambé Dec. **Mon.**; 2 (pull.) "Sudan."

[C. & L. coll.] 2 White Nile lat. 12° N. Jan., 1 Melut Jan., 2 Tonga Feb. **U.N.**

[Gurney coll.] 1 Meroë Jan. **Ber.**

Abundant.

Hemiparra crassirostris crassirostris.

Chettusia crassirostris Hartl. J. f. O. 1855, p. 427: Nubia.

Hemiparra crassirostris Reichw. V. A. i. p. 184.

[B. coll.] 1 Bor Feb., 1 near Shambé Jan., 1 Mongalla "summer," **Mon.**

Comparatively rare, and mostly recorded from the south of the country.

Vanellochettusia leucura.

Charadrius leucurus Licht. in Eversm. Reis. Orenb. nach Buchara, 1823, p. 137: between Kuwan and Jan Darya, Turkestan.

Chætusia leucura Reichw. V. A. i. p. 183.

Vanellus leucurus Butler, Ibis, 1905, p. 395.

[B. coll.] 3 Khartoum Feb.; 1 near Dueim Feb. **W.N.**

[C. & L. coll.] 2 near Ginga Dec. **Sen.**

In winter: Khartoum and White Nile (*A. L. B.*). For generic name, *vide* Richmond, P. U.S. Nat. Mus. xxxv. p. 647.

Chettusia gregaria.

Charadrius gregarius Pallas, Reis. Russ. Reichs, i. 1771, p. 456: Volga.

Chætusia gregaria Reichw. V. A. i. p. 183.

Vanellus gregarius Butler, Ibis, 1905, p. 396.

[B. coll.] 2 Khartoum Jan. & Feb.

[C. & L. coll.] 1 Kamisa Dec. **Sen.**; 1 Tonga Feb. **U.N.**

In winter. Rather rare (*A. L. B.*).

Vanellus vanellus.

Tringa vanellus Linn. Syst. Nat. 10th ed. 1758, p. 148: Europe and Africa, restricted type-locality Sweden.

Mr. W. P. Lowe informs us that on Jan. 12th, 1914, near

Kosti, White Nile Province, he saw and heard a Lapwing, but it was unfortunately too wild to get a shot at. Heuglin (Orn. Nordost-Afr. iii. p. 994) mentions records from "Nubia" and the mouth of the White Nile.

Family ARENARIIDÆ.

Arenaria interpres interpres.

Tringa interpres Linn. Syst. Nat. 10th ed. 1758, p. 148: Europe and N. America, restricted type-locality Sweden.

Arenaria interpres Reichw. V. A. i. p. 142.

Strepsilas interpres Butler, Ibis, 1905, p. 396.

The Turnstone has been recorded from the White Nile by Mr. Butler, and from Suakin by Heuglin.

Family HÆMATOPODIDÆ.

Hæmatopus ostralegus ostralegus.

Hæmatopus ostralegus Linn. Syst. Nat. 10th ed. 1758, p. 152: Europe and N. America, restricted type-locality Öland; Reichw. V. A. i. p. 141.

The Oyster-catcher is recorded from Suakin by Penton.

Family LARIDÆ.

Larus canus canus.

Larus canus Linn. Syst. Nat. 10th ed. 1758, p. 136: Europe, restricted type-locality Sweden.

The Common Gull is recorded by Vierthaler from Khartoum according to Heuglin, Orn. Nordost-Afr. p. 1379: so also is the Great Black-backed Gull! We do not admit either bird to a place in the Sudanese list on present evidence, though there is no inherent impossibility in their occurrence.

Larus cachinnans.

Larus cachinnans Pallas, Zoogr. Rosso-Asiat. ii. 1827, p. 318: S.E. Russia; Reichw. V. A. i. p. 42.

The Yellow-legged Herring-Gull is definitely reported by Heuglin from the Red Sea, where it occurs as far south as

Aden and the Somali coast. Heuglin also records Herring-Gulls (though as the common species *L. argentatus*—which is most unlikely) as common on the Nile as far south as the junction of the Blue and White Niles. These records may almost certainly be taken as *L. cachinnans* also.

Larus fuscus fuscus.

Larus fuscus Linn. Syst. Nat. 10th ed. 1758, p. 136: Europe, restricted type-locality Sweden; Reichw. V. A. i. p. 41; Butler, Ibis, 1905, p. 382, 1909, p. 403.

[B. coll.] 1 Port Sudan May, R.S.

The Lesser Black-backed Gull is common in winter, both in the Nile Valley and on the Red Sea coast.

Larus (Ichthyaëtus) ichthyaëtus.

Larus ichthyaëtus Pallas, Reise Russ. Reichs, ii. 1773, p. 713: Caspian Sea.

Larus phœnicopos (Gmel.); Reichw. V. A. i. p. 46.

The Great Black-headed Gull is recorded from the Red Sea coast, and, though there are as yet no definite records, is almost certain to occur on that part of it which lies within our limits.

Larus (Chroicocephalus) ridibundus.

Larus ridibundus Linn. Syst. Nat. 10th ed. 1758, p. 225: Habitat in Mari Europæo, restricted type-locality England; Reichw. V. A. i. p. 47; Butler, Ibis, 1908, p. 256.

[B. coll.] 1 Dueim Jan. W.N.

White and Blue Niles in winter, not common.

The Mediterranean Black-headed Gull (*L. melanocephalus*) is reported by Brehm from "Nubia."

Larus (Adelarus) leucophthalmus.

Larus leucophthalmus Temm. Pl. Col. livr. 62, 1825, pl. 366: Coasts of the Red Sea; Reichw. V. A. i. p. 48; Butler, Ibis, 1909, p. 403.

[B. coll.] 3 Port Sudan May, R.S.

[C. & L. coll.] 5 Port Sudan Dec. & Apl. R.S.

Abundant on the Red Sea Coast.

Larus (Adelarus) hemprichi.

Adelarus hemprichii Bruch, J. f. O. 1853, p. 106: Red Sea.

Larus hemprichi Reichw. V. A. i. p. 49.

[C. & L. coll.] 1 Port Sudan Dec. **R.S.**

Rhynchops flavirostris.

Rhynchops flavirostris Vieill. Nouv. Dict. iii. 1816, p. 383: Senegal (*op. cit.* xxix. p. 283); Reichw. V. A. i. p. 76; Butler, Ibis, 1905, p. 382.

[B. coll.] 4 Khartoum Apl. Nov. Dec.; 2 (pull.) near Roseires, **Sen.**

The Skimmer is found on all the larger rivers.

Hydrochelidon leucoptera leucoptera.

Sterna leucoptera Temm. Man. d'Orn. 1815, p. 483: Mediterranean.

Hydrochelidon leucoptera Reichw. V. A. i. p. 71; Butler, Ibis, 1905, p. 382.

[B. coll.] 3 Khartoum Apl. 20 and "autumn"; 8 Fashoda (Kodok) May, **U.N.**

Hydrochelidon nigra nigra.

Sterna nigra Linn. Syst. Nat. 10th ed. 1758, p. 137: Europe, restricted type-locality Sweden.

Hydrochelidon nigra Reichw. V. A. i. p. 70: Butler, Ibis, 1905, p. 382.

Hydrochelidon leucopareia leucopareia.

Sterna leucopareia Temm. Man. d'Orn. 2nd ed. ii. 1820, p. 746: Hungary.

Hydrochelidon hybrida (Pall.) Reichw. V. A. i. p. 72: Butler, Ibis, 1905, p. 382.

[B. coll.] 3 Khartoum Apl. 23–26.

All three species of *Hydrochelidon* are regular winter migrants to the Nile Valley, *H. nigra* being the least common.

Sterna repressa.

Sterna repressa Hartert, Nov. Zool. xxiii. 1918, p. 288, nom. nov. pro

Sterna albigena Heuglin in Peterman's Mittheilungen, 1861, p. 29: Arabia and Nubia (ex Licht.); Reichw. V. A. i. p. 65.

Common in the Red Sea. There is a specimen from Suakin in the Museum collection obtained by Penton.

Sterna (Sternula) albifrons saundersi ?

Sterna saundersi Hume, Stray Feathers, v. 1877, pp. 324–6: Karachi; Butler, Ibis, 1909, p. 403.

[B. coll.] 3 Port Sudan 24 & 26 May, R.S.

Mr. Mathews, in his 'Birds of Australia,' vol. ii. pp. 375–381, has made some interesting remarks on these little Terns, and has indicated some names which may be used for various races. We have examined the large amount of material in the British Museum and confess to be very little the wiser. The type of *S. saundersi* is a bird from Karachi, collected on the 5th of May. It has a decidedly small bill, and the outer and half the inner webs of the three outer primaries are black. The three Port Sudan birds listed above agree with it exactly. They are apparently in full breeding-plumage, but, according to Mr. Butler, were not in breeding condition. They differ from English and western European breeding-birds by their shorter bill and by the black colour of the webs of the three outer primaries, this colour being replaced by grey in the western bird and only occurring on the two outer primaries. They appear also somewhat smaller and paler in colour. Whether or not Hume's name will stand for the race, it is not possible to say from present material, as we have no breeding specimens from South Russia, the type-locality of *Sterna metopoleucos* S. G. Gmelin (Nov. Comm. Acad. Sci. Imp. Petrop. xv. 1771, p. 475), nor has a restricted type-locality been designated for *S. albifrons* (Vroeg, Cat. Adumb. 1764, p. 6: Europe). We suspect, however, that the name will stand, as a specimen from Bokhara obtained in May as well as one from Macedonia appear to be more like the western form.

The small Terns from the east Coast of Africa need a good deal of examination, and a new species (*S. novella*) was described from that region by Hartlaub. We might note also that there are not as yet in the Museum specimens in winter plumage of *S. balænarum* (unless South African examples referred by Saunders to *S. saundersi* are that species), which may and probably will be found to be very similar to the forms of *S. minuta* in winter.

It may be worth noting that Boyd Alexander found Little Terns on the Shari River in June, also that one or two Somaliland examples are much more like the form from western Europe which may very possibly migrate or wander through our limits.

Sterna (Gelochelidon) nilotica nilotica.

Sterna nilotica Gmelin, Syst. Nat. i. 1789, p. 606: Egypt (ex Hasselquist).

Gelochelidon nilotica Reichw. V. A. i. p. 51.

Sterna anglica Montagu; Butler, Ibis, 1905, p. 382, 1908, p. 256.

[B. coll.] 1 White Nile Oct.

[C. & L. coll.] 1 Hassania Island, 1 El Geteina Jan. **W.N.**; 1 White Nile lat. 10¾° N. **U.N.**

The Gull-billed Tern is abundant in winter; it is interesting to note that the El Geteina bird is marked ‘ Feeding on locusts in dry country.”

Sterna (Hydroprogne) caspia caspia.

Sterna caspia Pallas, Nov. Comm. Acad. Sci. Imp. Petrop. xiv. pt. i. 1770, p. 582: Caspian Sea; Reichw. V. A. i. p. 56; Butler, Ibis, 1905, p. 382.

[B. coll.] 1 Port Sudan 8 Apl. **R.S.**; 2 Khartoum Feb. & Apl. 15.

[C. & L. coll.] 1 Port Sudan Dec. **R.S.**

The Caspian Tern is common in winter, Mr. Butler also observed one at Khartoum on July 8th. Should Lepechin's names be considered truly binomial, this species should be called *Sterna tscheyrava* Lep. as this has priority over Pallas's name by several pages, and indeed was described a month earlier.

Sterna (Thalasseus) bergii velox.

Sterna velox Cretzschmar in Rüppell's Atlas, ii. 1827, tab. 13, p. 21: Coasts of the Red Sea.

Sterna bergii apud Butler, Ibis, 1909, p. 403.

[B. coll.] 2 Port Sudan May, R.S.

Mr. Mathews has given a revised list of the races of this Tern ('Birds of Australia,' ii. pp. 346–347), and, as regards the Red Sea form, an examination of the material in the Museum bears out his suggestions.

There is as yet no definite record from within our limits of the Sandwich Tern, *Sterna (Thalasseus) sandvicensis sandvicensis,* but it occurs freely in the Red Sea and will doubtless be included at some future time.

Sterna (Thalasseus) bengalensis arabica.

Thalasseus bengalensis arabicus Mathews, Birds of Australia, ii. 1912, p. 355.

Sterna media Horsf. et auct.; Reichw. V. A i. p. 60; Butler, Ibis, 1909, p. 403.

Smaller and lighter than the typical race. Mr. Mathews shows that *S. media* of Horsfield is preoccupied as a name for the typical race, as is also *S. affinis* of Cretzschmar for this one.

Family Podicipedidæ.

Podiceps ruficollis capensis.

Podiceps capensis Salvadori, Ann. Mus. Civ. Gen. (2) i. 1884, p. 252: South Africa.

Colymbus capensis Reichw. V. A. i. p. 18.

Mr. Butler states that the African Little Grebe occurs on both Niles, but is not numerous.

Family Rallidæ.

Porzana porzana.

Rallus porzana Linn. Syst. Nat. 12th ed. i. 1766, p. 262: Europe, restricted type-locality France.

Ortygometra porzana Reichw. V. A. i. p. 283.

Porzana maruetta (Leach); Butler, Ibis, 1905, p. 385, 1908, p. 257.

[B. coll.] 2 Khartoum Apl. 12, Oct. 19.

Common on migration.

Porzana parva.

Rallus parvus Scopoli, Ann. i. Hist. Nat. 1769, p. 108: Carniola.

Ortygometra parva Reichw. V. A. i. p. 285.

[B coll.] 3 Khartoum Oct. & Nov.

On migration, not common.

Crex crex.

Rallus crex Linn. Syst. Nat. 10th ed. 1758, p. 153: Europe, restricted type-locality Sweden.

Crex crex Reichw. V. A. i. p. 277.

Crex pratensis Bechst.; Butler, Ibis, 1905, p. 385.

[B. coll.] 2 Khartoum Sept. 18 & Oct.

The Land-Rail is common on migration.

Crecopsis egregia.

Crex egregia Peters, Monatsb. k. Akad. Berlin, 1854, p. 134: Mozambique; Reichw. V. A. i. p. 278.

This species just enters the southern boundary of the Sudan, being recorded from Gondokoro (Heuglin).

Limnocorax niger.

Rallus niger Gmel. Syst. Nat. i. pt. 2, 1789, p. 717: Cape of Good Hope.

Limnocorax niger Reichw. V. A. i. p. 279; Butler, Ibis, 1905, p. 385.

[B. coll.] 3 Kaka, 1 Taufikia, 3 Malakal June, **U.N.**

[C. & L. coll.] 2 near Lake No Feb. Mch., 1 Tonga Feb., 1 mouth of Bahr el Zeraf Mch., 1 White Nile lat. 12½° N. Jan., 1 lat. 9½° N. long. 31° 40 E. Mch. **U.N.**

[Chr. coll.] 1 Yambio Mch. **B.G.**

Common wherever there is water fringed with cover.

Gallinula chloropus chloropus.

Fulica chloropus Linn. Syst. Nat. 10th ed. 1758, p. 152: Europe, restricted type-locality England.

Gallinula chloropus Butler, Ibis, 1905, p. 385, 1908, p. 257.

[B. coll.] 1 Khartoum, Oct. 20.

This bird, an immature male with a wing of 180 mm., we must consider to be a wanderer from the north, and not a local breeding bird. In fact, we do not know of any definite record of the African Moorhen (*G. c. brachyptera* Brehm) ever having occurred in the Sudan. We should expect, however, that it will be found in the south of the country. Mr. Butler mentions that most of the Moorhens he saw at Khartoum were in a more or less exhausted state. Claude Grant (Ibis, 1915, pp. 47–49) gives a revision of the races of the Moorhen.

Gallinula angulata.

Gallinula angulata Sund. Œfv. K. Vet.-Ak. Forh. Stockh. 1850, p. 110: Interior of "Caffraria"; Reichw. V. A. i. p. 295.

Mr. Butler records a specimen as being captured alive at Singa **Sen.** by Capt. S. Flower. A second Sudanese example is included in the collection sent recently by Mr. King from Kajo Kaji **L.E.** collected on Jan. 25th, 1917.

Porphyrio alleni.

Porphyrio alleni Thomps. Ann. Mag. Nat Hist. x. 1842, p. 204: Niger; Reichw. V. A. i. p. 292.

[B. coll.] 3 Malakal, 1 Taufikia June, **U.N.**

[C. & L. coll.] 1 Lake No Feb. **U.N.**

Confined to the southern half of the country.

Fulica atra atra.

Fulica atra Linn. Syst. Nat. 10th ed. 1758, p. 152; Europe, restricted type-locality Sweden; Reichw. V. A. i. p. 297; Butler, Ibis, 1905, p. 385, 1908, p. 257.

[B. coll.] 1 Omdurman Nov. **Kh.**

A few stragglers as far south as Khartoum in winter.

Family Treronidæ.

Vinago waalia.

Columba waalia Gmelin, Bruce's Reisen in das Innern von Afrika, 1791, p. 31: Tcherkin nr. Lake Tsana (*cf.* Claude Grant, Ibis, 1915, p. 36).

Vinago waalia Reichw. V. A. i. p. 392; Butler, Ibis, 1905, p. 358, 1908, p. 248 (*calva*, errore).

[B. coll.] 3 Roseires Aug. **Sen.**; 2 Rumbek Jan., 2 Mayik Jan. & Apl., 2 Madâl May, **B.G.**; 2 Mongalla "summer," **Mon.**; 1 Rejaf Feb. **L.E.**

Neumann (J. f. O. 1904, p. 341) has described *V. w. cinereiceps* from the Gelo River. We have no specimens from that exact locality, but we can find no constant distinction in birds from the Sobat River or any other locality.

Vinago calva uellensis.

Vinago calva uellensis Reichw. J. f. O. 1912, p. 320: Jakoma, Welle R.

[Chr. coll.] 2 Yambio Mch. **B.G.**

This we believe to be the first record of *V. calva* in the Sudan. There seems little doubt that these two specimens belong to the race described by Reichenow from the Welle. With regard to the races of *V. calva*, we should like to draw attention to the paper by Hartert and Goodson in the Nov. Zool. xxv. 1918, pp. 348–354. We find that the material in the Museum agrees completely with their conclusions. The question of the use of *Treron* or *Vinago* as a generic name is one into which we have not entered.

Family Columbidæ.

Columba livia near **schimperi.**

Columba schimperi Bonaparte, Consp. Avium, ii. p. 48: (Abyssinia!) probably Egypt.

[B. coll.] 3 Gebeit Mch. **R.S.**

[C. & L. coll.] 2 rocky kopje on Sinkat-Erkowit Plain Mch. **R.S.**

These Pigeons from the Red Sea Province (Gebeit is some 50 miles W.S.W. of Suakin) appear to be nearest to the Egyptian form *C. l. schimperi* Bp., but they do not agree with that race exactly. They appear to be larger on the whole than Egyptian birds and quite distinctly darker. Neither this race nor *C. l. schimperi* have any definite white patch on the lower back, but the light colour of the back, which is the same as that of the scapulars and wing-coverts, meets the dark colour of the rump in a definite straight line, whereas in *C. l. palæstinæ* of Zedlitz, J. f. O. 1912, p. 339, there is on the lower back—in all our specimens at least—an intervening "buffer" patch of white. Again, on examining southern Arabian birds this same absence of any white is noticeable, but these again are darker still and in fact are approaching the dark *C. l. intermedia* of India. On the other hand, the only specimen in front of us from Muscat has, like western Persian birds (? *C. l. gaddi* Sarudny), a good deal of white. It appears, therefore, that we have an intergradation from the Egyptian bird, through the Red Sea Province birds, and the southern Arabian birds to *C. l. intermedia* of India, while the Palestine race and the Persian Gulf race may possibly be more closely connected with *C. l. livia* of Europe. Dr. Hartert, Nov. Zool. xxiii. p. 84, is of opinion that *C. l. palæstinæ* is identical with Arabian birds, but in that case there either must be two birds in Palestine, a dark-backed and a light, the former of which we have not got here, or his southern Arabian birds must be different from ours.

Columba (Stictœnas) guinea guinea.

Columba guinea Linn. Syst. Nat. 12th ed. i. 1766, p. 282: Guinea, ex Edwards.

[B. coll.] 1 Gedaref May, **Kas.**; 1 Dug Dug May, 1 Gadein Jan. **B.G.**

[C. & L. coll.] 1 Sobat River Jan., 2 nr. Tonga Feb. **U.N.**

The races of this Pigeon have lately been reviewed by Claude Grant, Ibis, 1915, pp. 37–39, and Hartert & Goodson, Nov. Zool. xxv. pp. 356–359. After examining the material in the Museum, we find we can recognise:—

1. C. G. GUINEA, *op. cit.* With a wing of from 216 (omitting "worn" specimens) to 236 mm. We can find nothing over this measurement, though a number are close to it.

   Range. From Gambia to the Gold Coast and across through the Sudan and Ankole to the greater part of Abyssinia, Somaliland, and the whole of British East Africa to Kilimanjaro.

With this we unite unhesitatingly *C. g. longipennis* Reichw.

2. C. G. DILLONI.

   Stictœnas dilloni Bp. Comptes Rend. xxxix. 1854, p. 1105: "Abyssinia," probably Eritrea.

   A most distinctly larger bird than *C. g. guinea.* Wing (according to Hartert & Goodson) 236–245 mm. Two specimens in the Museum measure 242, 245, one from Kokai 229! With these we should place a bird labelled "E. Africa" Verreaux, and which very possibly came from Eritrea, with a wing of 244 mm.

   Range. Eritrea.

3. C. G. UHEHENSIS Reichw. O. M. 1898, p. 82: Iringa, of which we know nothing.

4. C. G. PHÆONOTA Gray: South Africa, which is plainly different.

Family TURTURIDÆ.

Streptopelia semitorquata semitorquata?

Columba semitorquata Rüpp. Neue Wirb. 1835, p. 66, pl. 23: Taranta Mountains, N. Abyssinia.

[B. coll.] 3 Roseires July, **Sen.**

[Chr. coll.] 1 Yei Dec. **L.E.**

In 'The Ibis,' 1915, pp. 41, 42, Claude Grant revised the races of this species, but we can in no way agree with the conclusions. Firstly, *Turtur shelleyi* of Salvadori, Cat. Birds

Brit. Mus. xxi. 1893, p. 419: Niger, cannot possibly be a race of this species, because we have an abundance of specimens of *S. semitorquata* from the same district. It is, of course, a race of *S. decipiens*, as pointed out by Zedlitz, J. f. O. 1910, p. 343.

Secondly, we do not think *S. s. minor* of Erlanger is a synonym of *S. s. semitorquata*, or, rather, we have no proof that it is, as we have not a single specimen from southern Somaliland. Those from the coast of British East Africa, which one would expect to be nearest to it, are certainly of very small size, wings 175 mm. and under. Thirdly, owing to paucity of material from the type-locality, we should not like to be certain whether the typical race is really separable from the West African form known as *S. s. erythrophrys* (Swains.). At present we must regard it as distinct, but there seem to us no tangible differences between the Lado bird and Roseires specimens, though, according to Zedlitz (J. f. O. 1914, p. 644), *S. s. intermedius* of Erlanger from S. Abyssinia is synonymous with *S. s. erythrophrys*, and the Lado bird should be of this form, while the Roseires birds should be nearer the typical race.

There are two Arabian specimens in the Museum which appear rather distinct, as their backs are lighter brown and their undersides considerably more bluish and less pinky. They may prove to be separable when more material is obtained.

Streptopelia decipiens decipiens.

Turtur decipiens Finsch & Hartlaub, Vög. Ostafr. 1870, p. 544: East Africa—more probably Dongola, *cf.* Zedlitz, J. f. O. 1914, p. 647, note; Butler, Ibis, 1905, p. 359.

[B. coll.] 4 Khartoum May.

[C. & L. coll.] 1 Singa, 1 Kamisa Dec. Sen.

[Gurney coll.] 1 Meroë Feb. Ber.

Common and often abundant in the northern half of the country.

S. decipiens is not unlike *S. semitorquata*, but is somewhat smaller, a good deal greyer on the underside, lighter on the back, and the blue-grey wing-coverts contrast strongly with the blackish primaries and primary-coverts—in *S. semitorquata* they are dark like the primaries and their coverts.

Streptopelia decipiens nr. permista.

Turtur ambiguus permistus Reichw. V. A. iii. 1905, p. 808: "East Africa, from Victoria Nyanza to Zambesi."

Turtur decipiens apud Butler, Ibis, 1908, p. 249, 1909, p. 88.

[B. coll.] 1 Bahr el Zeraf June, **U.N.**; 1 Shambé May, 1 Gigging "summer," **Mon.**; 1 Wau Apl. **B.G.**

[C. & L. coll] 1 Bahr el Zeraf Mch., 1 Meshra Zeraf Jan. (albino), 2 between Sobat R. and Bahr el Zeraf Feb. **U.N.**

These Doves agree best with Reichenow's description of *S. d. permista*, but are slightly out of its supposed range. They are a good deal more richly coloured than the more northern *S. d. decipiens*, though there are intermediate examples. Close to them also, but possibly still more brightly coloured, is *S. d. shelleyi* Salvad. from the Niger. A good review of the races of this species is given by Zedlitz, J. f. O. 1914, pp. 645–649. We have not sufficient material to confirm or dispute his conclusions.

Streptopelia vinacea barbaru.

Streptopelia barbaru Antin. Cat. di Ucc. 1884, p. 89: Sennar and Kordofan.

Turtur vinaceus apud Butler, Ibis, 1909, p. 88.

[B. coll.] 1 Khor Gitti Mch., 1 Wau Apl. **B.G.**

These two examples are probably intermediate between the typical race from north-western Africa and *S. v. barbaru* from "Sennar and Kordofan." They have a wing measurement of 144 and 136 mm. A list of the races of this species is given by Zedlitz, J. f. O. 1910, p. 344. It is remarkable that we have no specimens whatever from what Antinori gives as typical localities. Salvadori states, in the Cat. Birds Brit. Mus. xxi. p. 429, that he has examined Antinori's type and that it is this species, otherwise a mis-application of names would suggest itself.

Streptopelia vinacea erythreæ.

Turtur vinaceus erythreæ Neum. O. M. 1904, p. 82: Salomona near Massowa.

[C. & L. coll.] 1 Sinkat Mch. **R.S.**

This example with a wing of 150 mm. in all probability belongs to the above form, though we have no specimens with which to compare it.

Streptopelia roseogrisea roseogrisea.

Columba roseogrisea Sund. Krit. om Levaill. 1857, p. 54: Nubia.

Turtur roseigriseus Butler, Ibis, 1905, p. 359.

[B. coll.] 1 Khartoum May.

Streptopelia roseogrisea arabica.

Turtur roseogriseus arabicus Neum. O. M. xii. 1904, p. 31: Lahej, S. Arabia.

Turtur roseigriseus apud Butler, Ibis, 1908, p. 249.

[B. coll.] 1 Khor Arbat May, **R.S.**

The differences between these two races are well set out by Neumann, O. M. 1904, p. 83. The most noticeable difference between our two specimens is the greater amoun of vinous flush on the throat and breast of the Red Sea coast bird and the narrower ring of black round its neck. This group, which is very closely allied to the *S. vinacea* group, is distinguished by the absence of a black loral streak, whiter under wing-coverts, and paler coloration.

Streptopelia turtur turtur.

Columba turtur Linn. Syst. Nat. 10th ed. 1758, p. 164: England (India, *errore*).

Turtur turtur Reichw. V. A. i. p. 405.

Turtur communis Butler, Ibis, 1905, p. 359.

[C. & L. coll.] 1 Senga Dec. **Sen.**

This specimen and the only other Sudanese example we can find in the Museum collection appear to belong to the typical race. It seems probable, however, that the sandy-coloured form *S. t. arenicola* (Hartert, Nov. Zool. i. 1894,

p. 42: Fao, Persian Gulf) may also occur in the Sudan. Mr. Butler and also Reichenow record *S. t. isabellina* (*Turtur isabellinus* Bp. Comptes Rend. xliii. 1856, p. 942: Egypt) as occurring in the Sudan. We unfortunately have no specimens, but there seems to us a possibility that some of their records may refer to winter birds of *S. t. arenicola*. Reichenow records *S. lugens* (*Columba lugens* Rüpp. Neue Wirb. 1835, p. 64: Abyssinian Highlands) as occurring at Dongola, but this is an error, as Rüppell was referring to *S. turtur*.

Stigmatopelia senegalensis sudanensis, subsp. nov.

[B. coll.] 1 Khartoum May.

This race may be distinguished from all others from the mainland of Africa by its distinctly pale coloration; the breast below the collar is pale vinous pink of a more bluish, less reddish tinge than in its nearest ally *S. s. æquatorialis*; the female is paler than the male.

The few specimens we have are also of small size, wing 128–133 mm.

Type: a female collected by Hawker at Kaka, Upper Nile Province, 5 May, 1901. B.M. reg. no. 1902. 4. 20. 246.

Range. Wady Halfa to Lake No. We have no specimens from north of Khartoum, but as Dr. Hartert mentions pale birds from that region, Nov. Zool. xxiii. 1916, p. 83, it is probable that the range of this race extends to the northern boundary of the Sudan.

Stigmatopelia senegalensis æquatorialis.

Turtur senegalensis æquatorialis Erlanger, J. f. O. 1905, pp. 116–117, pl. 5: Menaballa, Abyssinia.

[B. coll.] 1 Sheik Tombé May, **Mon.**; 1 Tembura Mch. **B.G.**; 1 Rejaf Feb. **L.E.**

[C. & L. coll.] 1 Sinkat Mch. **R.S.**

The races of *S. senegalensis* have lately been worked out by Dr. Hartert, Nov. Zool. xxiii. pp. 82–83. On examination of the material in the Museum, however, we find that we must uphold Erlanger in his separation of the north-west African form from birds from the rest of Africa. We must also separate the northern Sudan birds as above. The African races then appear to be :—

1. S. S. SENEGALENSIS.

Columba senegalensis Linn. Syst. Nat. 12th ed. i. 1766, p. 283 : Senegal ex Brisson.

Rufous both on back and underside with very little bluish tinge, the breast below the collar being strongly reddish pink. Wing 130–137 mm.

Range. Senegal probably to Northern Nigeria. The only example from the latter district we have appears to be nearest to the typical race.

2. S. S. ÆQUATORIALIS, *op. cit.*

A less reddish bird above and below ; this is most noticeable just below the collar where the breast is merely vinous pink, not reddish pink. Wing 132–144 mm.

Range. From St. Thomas Island through Southern Nigeria to the Bahr el Ghazal, Abyssinia, north to the Red Sea Province of the Sudan, Somaliland, and all Africa south of these countries. Also to S. Arabia and possibly Palestine.

3. S. S. ÆGYPTIACA.

Columba ægyptiaca Lath. Ind. Orn. ii. 1790, p. 607 : ex Forskål, Egypt.

A very rufous bird, redder even than *S. s. senegalensis* and larger, wing 133–151 mm. ; the rufous of the breast extends far down the chest, and that of the back on to the rump.

Range. Egypt only.

Plate v. of the J. f. O. 1905 gives a very fair idea of the distinctions of these three races.

4. S. S. SUDANENSIS, *op. cit.*

Differences as above.

Range. Wadi Halfa to Lake No.

5. S. s. SOKOTRÆ Claude Grant, Bull. B. O. C. xxxv. 1914, p. 19 : Socotra.

   Although widely separated geographically from the last race, and with *S. s. æquatorialis* intervening, it happens to be practically identical with *S. s. sudanensis*.

6. S. s. PHŒNICOPHILA Hartert, Nov. Zool. xxiii. 1916, p. 82. No exact type-locality given, but from "Date groves south of the Atlas in Algeria, Tunisia, and Marocco."

   Of this race we have no specimens, but it is given as browner and larger than *S. s. senegalensis*, wing 139–152 mm.

Turtur abyssinica delicatula.

Chalcopelia delicatula Sharpe, Bull. B. O. C. xii. 1902, p. 84 : Goz Abu Gumar, White Nile.

Chalcopelia afra (nec Linn.), Butler, Ibis, 1908, p. 249, 1909, p. 88.

[B. coll.] 4 Roseires Aug. & Sept. **Sen.** ; 1 Jebel Ahmed Agha May, 1 Malakal Dec. **U.N.** ; 1 Wau Apl. **B.G.**

[C. & L. coll.] 1 Kamisa Dec., 120 miles above Sennar Jan. **Sen.**

[Gurney coll.] 1 Meroë Feb. **Sen.**

This race may or may not be distinct from *C. abyssinica* Sharpe from northern Abyssinia. The latter was described at the same time as the above form and separated on the colour of the legs and feet. We can find no difference in colour of plumage, but as the colour of the bill is—as remarked below—a distinctly material character in these birds, we should not like to say that the colour of the legs and feet was of no importance.

The Blue-spotted Dove has for some time now been regarded as distinct from the Green-spotted Dove. Not only is this so, however, but there are two species of Blue-spotted Dove occurring side by side in the northern half of Africa. The material before us seems conclusive on the point. The adults of the two species may be distinguished as follows :—

A. A darker bird, with a brownish back to the head, not a pure blue-grey one, a browner back, a brown-tinged breast, and with the rest of the underside a dirty brownish white. Bill longer and stronger, red at the base, red, yellow, or orange for the apical portion; tip always yellow in dried skins.

B. A lighter bird, with a clear blue-grey back to the head, a grey not brown back, a vinous or pinkish breast, and with the rest of the underside vinous white. Bill shorter and weaker, dusky, vinous black, or black throughout, in dried skins always black.

These birds occur together in Abyssinia, the Bahr el Ghazal, the Shari River country, and the Gold Coast Colony, from all of which countries we have specimens of *both* forms. Also as we have the dark form from Gambia, and Lord Rothschild has the light form from Senegal (*cf.* Bull. B. O. C. xxxviii. p. 37), we believe that both species occur in Senegal!

The question of names then arises.

Linnæus's *Columba afra* was founded on Brisson's *Turtur senegalensis* (Briss. Orn. i. p. 122) from Senegal. Now which bird did Brisson have? After a careful examination of Brisson's description, we have come to the conclusion that it was the dark form, and this view is strengthened by the colour of the bill, which is given as red. Among the many collectors whose work is represented at the Museum, several have given the colour of the dark bird's bill as red, none have given the colour of the light bird's bill as anything but black or "vinous black." The name of the dark bird, therefore, we consider is *Turtur afra* (Linn.). The oldest name for the light bird is *T. abyssinica* (Sharpe).

There are probably several races of *Turtur afra*. The names available at present are *T. a. kilimensis* (Mearns) for the Kilimanjaro form, and *T. a. sclateri* Rothschild for a possible Uganda race. There is another race which we think should be named. This is the race of *T. afra* from

Abyssinia, with which Mearns compared his *T. a. kilimensis* (Proc. U.S. Nat. Mus. xlviii. 1915, p. 383) and which he believed to be identical with *T. abyssinica* (Sharpe). This may be characterised as follows:—

A race of *T. afra*, but, except for its long yellow-tipped bill, differing more from that form than it does from *T. abyssinica*: much paler than *T. a. afra* and with the belly and flanks almost white. From *T. abyssinica* it may be distinguished by its longer yellow-tipped bill, its slightly browner back, and by the breast being washed with brown and not purely vinous pink. From *T. a. kilimensis,* of which we have no specimens, it differs as pointed out by Mearns in his description of that race. This Abyssinian race we propose to name

TURTUR AFRA MEARNSI, subsp. nov.

Type: ♀. Roguecha, south of Adis Ababa, Abyssinia; collected by A. E. Pease, 14 Feb., 1901. B.M. reg. no. 1902.1.20.295.

Turtur afra subsp. ?

[Chr. coll.] 1 Meridi Feb. **B.G.**

We have not sufficient material from this region or from the Welle river and Uganda to enable us to fix the subspecific status of this bird. It appears to be extremely close to *T. a. afra,* if not identical with it, though its general colour is more earthy brown and less reddish brown than in most examples of the typical race. It is separable at a glance from *T. abyssinica delicatula*, which also occurs in the Bahr el Ghazal. Among the Uganda specimens before us, we might note that birds from south-east of Ruwenzori seem to be noticeably paler than those from the mountain itself, and we are of opinion that there is room for considerable investigation into the races of this bird.

Œna capensis.

Columba capensis Linn. Syst. Nat. 12th ed. i. 1766, p. 286: Cape of Good Hope (ex Brisson); Reichw. V. A. i. p. 429; Butler, Ibis, 1905, p. 359, 1908, p. 249, 1909, p. 401.

[B. coll.] 3 Khartoum Feb. & May.
[C. & L. coll.] 1 Kamisa Dec. **Sen.**
[Chr. coll.] 1 Meridi Feb. **B.G.**
[Gurney coll.] 1 Meroë Feb. **Ber.**

Widely distributed and often common. We can in no way distinguish the northern birds from the southern as was done by Oberholser, P. U.S. Nat. Mus. xxviii. 1905, p. 843.

Family Pteroclididæ.

Pteroclurus senegallus.

Tetrao senegallus Linn. Mantissa, 1767–71, p. 526: Senegal (ex Daubenton).

Pteroclurus senegallus Reichw. V. A. i. p. 315.

Pterocles senegalensis nec Licht., Butler, Ibis, 1905, p. 389.

[B. coll.] 3 near Khartoum Nov. & Apl., 1 Omdurman Jan. **Kh.**
[Gurney coll.] 1 Meroë Feb. **Ber.**

There appear to be more races than one of this species, but again we are held up by having no material from anywhere near the type-locality—if Senegal really was the type-locality.

The birds before us seem to group themselves into possibly three races: firstly, a paler race from Egypt; secondly, a rufous race from southern Tripoli, Fezzan through the Sudan to Somaliland; and, thirdly, the Indian birds, which are more like the Egyptian form, but with a noticeably blue flush on the hind-neck of the males. A possible name for the Sudanese form would be *P. s. guttatus* (*Pterocles guttatus* Licht. Verz. Doubl. 1823, p. 64, ex desertis Nubiæ). The examination of further material, however, has made us very doubtful whether any races can really be separated.

Pteroclurus senegalensis subsp. ?

Pteroclurus senegalensis Licht. Verz. Doubl. 1823, p. 64: Senegambia.

Pterocles exustus Temminck et auctorum; Butler, Ibis, 1905, p. 389, 1909, p. 404.

[B. coll.] 4 near Khartoum Nov. & Dec., 2 near Omdurman Nov. & Apl. **Kh.**

[C. & L. coll.] 1 Sinkat-Erkowit Plain Apl. **R.S.**; 1 Jebelein Jan., 1 White Nile lat. 12° N. Jan. **U.N.**

The races of this bird, under the name *P. exustus* Temm., have been reviewed by several authors, the last of whom appears to be Claude Grant, in 'The Ibis,' 1915, pp. 31, 32. With some of his conclusions we cannot entirely identify ourselves. To start with, the type-locality is Senegambia, and we have no material whatever from that region. Claude Grant says that Egyptian specimens may be taken as typical, but—without proof—we must strongly dissent from this view. We think it far more likely from all analogy that three birds collected by Alexander at Lake Chad and widely distinct from examples from Egypt, will be found to be nearer the typical race than the Egyptian specimens.

The birds in the Museum collection group themselves as follows :—

1. A dark olivaceous-backed large race from Egypt. The name of this is *P. s. senegalensis* if Senegal birds cannot be distinguished from it, if they can be a new name will be required.

2. A paler race slightly smaller and with the back still tinged with olivaceous, but not nearly so strongly as in Egyptian examples. The race extends from Lake Chad through the Sudan to Abyssinia, though we may mention that two female specimens from Lake Chad are uncommonly pale. The name of this race is *P. s. senegalensis* if the Senegal birds—as we expect—are identical with it, *P. s. ellioti* (Bogd.) if they are not. Bogdanow described *Pterocles ellioti* from Abyssinia (Bull. Ac. Sci. Pétersb. xxvii. no. 2, 1881, p. 167).

3. A still paler race on the upper side but with a richer fulvous breast, much the same size as the last. This race ranges from Somaliland to as far south as the northern Guaso Nyiro in British East Africa, and its

name is *P. s. somalicus* Hartert (Nov. Zool. 1900, p. 28: Milmil, Somaliland).

4. A richer-coloured darker-backed race, more like the Egyptian race on the back but with a much more rufous tone, especially on the breast, and smaller. This race comes from the Kilimanjaro region and Masailand, and its name is *P. s. olivascens* Hartert (O. M. xvii. 1909, p. 183: Campi ya Simba, B.E.A.).

Outside Africa two other races have been described, *P. s. orientalis* Hartert from India and *P. s. erlangeri* Neum. from southern Arabia.

We cannot admit that Lichtenstein's *P. senegalensis* is invalidated by Linnaeus's previous *P. senegallus*, though from the point of view of clarity it is unfortunate that it is not.

Pterocles coronatus coronatus.

Pterocles coronatus Licht. Verz. Doubl. 1823, p. 65: Nubia.

There happen to be no specimens of this Sand-Grouse in the present collections, but it is not uncommon in the northern regions of the Sudan. The Museum possesses examples from Wady Halfa and the 2nd and 5th Cataracts. On examining the series from the whole range of this species, it was evident at a glance that there were two or three races. The Indian birds stand out as dark and well-marked, and southern Tunisian examples appear exactly the opposite. Inasmuch, however, as our birds are the typical race we will leave the naming of these to others.

Pterocles lichtensteini lichtensteini.

Pterocles lichtensteini Temm. Pl. Col. livr. 60, 1825, pls. 355, 361: Nubia; Butler, Ibis, 1909, p. 404.

[B. coll.] 1 Khor Arbat May, **R.S.**

[C. & L. coll.] 3 Sinkat Mch. **R.S.**

These birds are in all probability the typical form, though the term "Nubia" as used by Temminck is rather vague. The following races of this species have been separated, but we have not sufficient material to confirm or dispute all of them :—

P. l. lichtensteini Temm. *op. cit.* : Nubia.
P. l. hyperythrus Erl. J. f. O. 1905, p. 94: S. Somaliland.
P. l. arabicus Neum. O. M. 1909, p. 152 : S. Arabia.
P. l. sukensis Neum. O. M. 1909, p. 153 : E. Africa.
P. l. targius Schweppenburg, O. M. 1916, p. 56 : Tuareg country, Sahara.
P. l. abessinicus Schweppenburg, O. M. 1916, p. 57 : Abyssinia and N. Somaliland.

Pterocles quadricinctus lowei.

Pterocles quadricinctus lowei Claude Grant, Bull. B. O. C. xxxv. 1914, p. 19: Renk, White Nile.

Pterocles quadricinctus apud Butler, Ibis, 1905, p. 390, 1908, p. 260, 1909, p. 90.

[B. coll.] 1 Setit river May, **Kas.** ; 1 Jebel Marba Apl. **Sen.** ; 1 El Obeid Apl. **Kor.** ; 1 Sobat river Mch. **U.N.** ; 1 Mongalla Jan. **Mon.**; 1 Lado Feb. **L.E.** ; 1 Raffali Feb. **B G.**

[C. & L. coll.] 1 Tonga Feb., 6 adults 1 juv. near Lake No Feb. **U.N.**

These specimens all argee with C. Grant's type of *P. q. lowei,* which seems a very well-defined eastern race.

Family Turnicidæ.

Turnix sylvatica lepurana.

Ortygis lepurana A. Smith, Rep. Exp. App. 1836, p. 55: near Kurrichane, W. Transvaal.

Turnix lepurana Reichw. V. A. i. p. 301; Butler, Ibis, 1908, p. 258.

[C. & L. coll.] 2 Bahr el Zeraf Feb. **U.N.**

We cannot in any way separate these two specimens from the South African form, though *T. s. alleni* Mearns from East Africa (Smithsonian Misc. Coll. lvi. no. 20, p. 5) seems a well-marked intervening race. Mr. Butler notes this species as seen but not obtained near Wau, **B.G.**

Family Numididæ.

Numida ptilorhyncha ptilorhyncha.

Numida ptilorhyncha Lesson, Traité d'Orn. 1831, p. 498: Mareb river, N. Abyssinia (*cf.* Claude Grant, Ibis, 1915, p. 26); Butler, Ibis, 1905, p. 388, 1908, p. 260.

[B. coll.] 3 Jebel Ahmed Agha Jan. **U.N.**

[C. & L. coll.] 2 Kamisa Dec. **Sen.**

Claude Grant has reviewed these birds in 'The Ibis,' 1915, pp. 24–30, and, until we have a great deal more material than is at present available, we are content to abide by his conclusions. The specimens above we believe to belong to the typical race, but Claude Grant is of opinion that those collected by Hawker at Kaka **U.N.** are *N. p. major* Hartl. It is probable, therefore, that *N. p. ptilorhyncha* is the race inhabiting the northern half of the country, and that *N. p. major* enters it from the south, and there is no exact demarcation possible between the two.

Family Phasianidæ.

Coturnix coturnix coturnix.

Tetrao coturnix Linn. Syst. Nat. 10th ed. 1758, p. 161: Europe, Asia, Africa; restricted type-locality Sweden.

Coturnix communis (Bonn.); Butler, Ibis, 1905, p. 387.

[B. coll.] 1 Erkowit, 1 Kamobsana Mch. **R.S.**; 1 Shendi May, **Ber.**; 5 Khartoum Nov. Dec. Apl.

[C. & L. coll.] 2 near Kamisa Dec. **Sen.**

Dr. Hartert has reviewed the forms of the Common Quail in Nov. Zool. xxiv. 1917, pp. 420–425. Our specimens appear to be undoubtedly of the typical race.

Coturnix delegorguei.

Coturnix delegorguei Deleg. Voy. Afr. Austr. ii. 1847, p. 615: Upper Limpopo river; Reichw. V. A. i. p. 507; Butler, Ibis, 1908, p. 258.

[B. coll.] 2 Malakal June, **U.N.**; 2 Amien Apl. **B.G.**

We cannot separate these Quails from South African examples. On examining a series of these birds, however, we are inclined to suggest that the birds from the Island of St. Thomas are a somewhat darker resident race, while those from southern Arabia are very noticeably paler and more sandy in coloration.

Ptilopachus petrosus brehmi.

Ptilopachus fuscus brehmi Neum. Bull. B. O. C. xxi. 1908, p. 68: Jebel Melpes, *i. e.* probably Jebil Melbis, Kordofan.

Ptilopachys fuscus apud Butler, Ibis, 1905, p. 388.

[B. coll.] 9 Jebil Melbis Apl., 1 El Ein Mch. **Kor.**

This race of *P. petrosus* was described as above by Neumann. Its range is not apparently the whole of Kordofan, but only the northern portion. From the material now available it is obvious at a glance that the four races of this species already described are not sufficient. Two others are easily recognisable in the Sudan. The first of these is a bird rather nearer typical *P. p. petrosus* than *P. p. brehmi*, but distinctly more rufous. The feathers of the crown are redder also, and with little of the grey edging found in *P. p. fuscus*. A good deal darker bird than *P. p. brehmi*. We name this

PTILOPACHUS PETROSUS BUTLERI, subsp. nov.,

and its range is apparently southern Kordofan and the Bahr el Ghazal Province, except the eastern edge to the Gribingui, where it was met with by Alexander. Type: ♂, collected by A. L. Butler at Buval, near Wau, Bahr el Ghazal, 29. 1. 1907. B.M. reg. no. 1916. 9. 20. 670.

Of this we have:—

[B. coll.] 1 Raffali Feb., 1 Kojali Feb., 1 nr. Wau Jan., 1 Pongo river Mch. **B.G.**; and 2 from Khor Nabag, Kordofan, presented by W. B. Halhead, 1 from the Bahr el Ghazal by G. Blaine, and 1 from the Gribingui river, Lake Chad territory, by Alexander.

According to Mr. Butler (Ibis, 1908, p. 259) it is a common bird in the ironstone country.

The second race we have to name is one from the Lado Enclave, the extreme easterly portion of the Bahr el Ghazal bordering it, and probably the Nile Province of Uganda. This is a much darker bird than the last and is very close to *P. p. florentiæ* Grant from British East Africa, but it is distinguished by a more rufous tinge on the back, not grey-brown as in that race. This we name

PTILOPACHUS PETROSUS LADOENSIS, subsp. nov.

Type from Mvolo, close to the boundary between the Bahr el Ghazal and Lado Enclave, June 1905, presented by Major H. Bray, B.M. reg. no. 1909. 8. 7. 120.

Hartert has shown (Nov. Zool. xxiv. p. 276) that the name *Tetrao petrosus* of Gmelin refers to this species and not to the Barbary Partridge. The races of *P. p. petrosus* then are :—

1. P. P. PETROSUS.
   Tetrao petrosus Gmel. Syst. Nat. i. pt. 2, 1789, p. 758 : Gambia (ex Buffon, ex Stibbs).
   Range. Senegal to Northern Nigeria and the Shari region.
2. P. P. BREHMI Neum. *op. cit.*
   Range. Northern Kordofan.
3. P. P. MAJOR Neum. *ibid.*
   Range. Northern Abyssinia.
4. P. P. BUTLERI.
   Range. Bahr el Ghazal westwards to Gribingui River.
5. P. P. LADOENSIS.
   Range. Lado Enclave and surrounding districts.
6. P. P. FLORENTIÆ.
   O.-Grant, Bull. B. O. C. x. 1900, p. cvii : Gessema, B.E.A.
   Range. British East Africa.

Francolinus erckeli pentoni.

Francolinus erckeli pentoni M.-Praed, Bull. B. O. C. xl. 1920, p. 141 : Erkowit.

Francolinus erckeli apud Butler, Ibis, 1908, p. 259.

[B. coll.] 7 Erkowit Mch. **R.S.**
[C. & L. coll.] 6 Erkowit Apl. **R.S.**

A remarkably distinct race of *F. erckeli* Rüpp., differing chiefly by its paler and greyer colour. It seems to be confined to the district round Erkowit. An intermediate race between it and *F. erckeli* occurs in Eritrea.

Francolinus icterorhynchus icterorhynchus.

Francolinus icterorhynchus Heuglin, J. f. O. 1863, p. 275: Bongo, **B.G.**; Butler, Ibis, 1908, p. 259, 1909, p. 89.

[B. coll.] 1 Pongo river, 1 Chak Chak Feb., 1 Tembura Mch., 3 Wau Apl. **B.G.**

Francoiinus icterorhynchus emini.

Francolinus icterorhynchus emini Neum. Orn. Monatsber. 1907, p. 198: west of Lake Albert.

[B. coll.] 1 Kajo Kaji Mch. **L.E.**

This is a considerably darker form than the typical race, and the heavily marked throat and breast are somewhat reminiscent of the *F. clappertoni* group. We can find no constant difference in size between the two races. The range of *F. i. icterorhynchus* extends apparently from the southern Bahr el Ghazal to the Shari river, while *F. i. emini* inhabits Uganda and the southern Lado Enclave.

Francolinus clappertoni clappertoni.

Francolinus clappertoni Children, Denham & Clapperton's Trav., App. xxi. 1826, p. 198: Bornu; Butler, Ibis, 1905, p. 387.

[B. coll.] 3 Jebil Melbis Apl. **Kor.**

[C. & L. coll.] 1 65 miles N.W. of El Obeid Jan. **Kor.** (Hon. G. Legge coll.).

Francolinus clappertoni clappertoni > heuglini (intermediate).

[C. & L. coll.] 2 White Nile lat. 13½° N. Jan. **W.N.**; 1 Jebelein Jan., 1 30 miles N. of Renk Feb. **U.N.**

Francolinus clappertoni heuglini.

Francolinus clappertoni heuglini Neum. O. M. 1907, p. 199: Meshra el Rek, **B.G.**

[B. coll.] 1 Malakal May, 1 nr. Lake No May, 1 Khor Attar Feb. **U.N.**

[C. & L. coll.] 3 nr. Lake No Feb. & Mch., 3 Tonga Feb., 2 Khor Filus Feb., 2 mouth of Zeraf river Feb., 1 mouth of Sobat river Feb., 1 lat. 9½° N. long. 30° 40′ E. Feb. **U.N.**

Francolinus clappertoni heuglini < gedgei (intermediate).

Francolinus gedgii apud Butler, Ibis, 1908, p. 258.

[B. coll.] 2 Mongalla "summer," **Mon.**; 1 Ayûm Jan., 1 Gadein Apl. **B.G.**

The fine series of these Francolins before us show very fairly definitely the limits of each race, and they show also how very much more the Game-birds are likely to vary within a given area than most other groups of birds. The range of *F. clappertoni* in its various forms is as follows:—

1. F. C. CLAPPERTONI Children, *op. cit.*

The palest form with a sandy-brown tone on the back, ground-colour of underside generally white.

Range. Lake Chad to Kordofan.

On the White Nile from about El Duem to Renk a form close to this race but tending towards the next is found. We have referred to it as *P. c. clappertoni > heuglini.*

2. F. C. HEUGLINI Neum. *op. cit.*

A much darker race with a dark grey not brown tone on the back, ground-colour of underside yellowish white, dark markings wider and heavier.

Range. From somewhere between Renk and Fashoda to the Sudd district of the eastern Bahr el Ghazal and the Upper Nile Province.

Further south in Mongalla and the southern Bahr el Ghazal another form occurs, which is near *P. c. heuglini*, but browner on the back and in reality intermediate between this race, *F. c. clappertoni,* and *F. c. gedgei.* It is possibly nearest the latter. We have referred to it as *F. c. heuglini < gedgei.*

3. F. C. GEDGEI.

Francolinus gedgii O.-Grant, Ibis, 1891, p. 124: Plains near Mt. Elgon.

The darkest race, though very little more so than *F. c. heuglini*, but with a browner, less grey tone on the back than that form.

Range. Mt. Elgon and Uganda.

Francolinus sharpei.

Francolinus sharpii O.-Grant, Ibis, 1892, p. 47: Bogosland.

[B. coll.] 1 Disa Apl., 4 Roseires July & Aug. **Sen.**

These birds do not agree exactly with typical *F. sharpei* from northern Abyssinia. The feathers of the breast are darker and the ground-colour of the underside whiter, giving a more black and white appearance to the bird. On the whole, they are darker and better marked on the back also. *Francolinus sharpei* is very closely allied to *F. clappertoni* and its allies, but as it has more distinctive features than the other races of that species we prefer to keep it specifically separate at present.

F. königseggi Madarasz (Ann. Mus. Nat. Hung. xiii. 1915, p. 560: Dinder river), founded on a single female, is identical with or closely allied to this species.

Francolinus sephæna granti.

Francolinus granti Hartlaub, P. Z. S. 1865, p. 665: Unjamwezi, East Africa.

[B. coll.] 1 Mongalla Jan. **Mon.**; 2 Lado, 2 nr. Rejaf, Feb. **L.E.**

There seems to be no clearly marked distinction between these specimens and birds from East Africa and Uganda. Should they eventually prove separable, a name is to hand for them in *Francolinus ochrogaster* Hartlaub, J. f. O. 1882, p. 327, from the Upper Nile.

Francolinus coqui schlegeli.

Francolinus schlegeli Heugl. J. f. O. 1863, p. 275: Bongo river, Bahr el Ghazal.

We have no specimens of this bird nor do we believe that any collector has met with it since the time of Heuglin. We have before us a coloured drawing of the type in the Stuttgart Museum and it seems to differ little from *F. coqui*, except that the barring of the underside is finer and the shoulders and wing-coverts are uniform light red.

Francolinus schuetti schuetti ?

Francolinus schuetti Cabanis, J. f. O. 1881, p. 351 : Lunda, Angola–Belgian Congo boundary.

[Chr. coll.] 1 Meridi Jan. **B.G.**

The races of this species have been reviewed by Claude Grant, Ibis, 1915, pp. 18–19, and we agree with his conclusions. Whether *F. s. zappeyi* Mearns can stand for the Uganda birds, with which our specimen is identical, we do not know, as we have no examples from Lunda, the type-locality of the original bird. We should have little hesitation, however, in refusing to admit two other races named by Mearns, viz., *F. s. keniensis* and *F. s. kapitensis*, and we have doubts whether the material at his disposal was sufficient to warrant such close subdivision.

We are by no means certain that *F. schuetti* is any more than a race of *F. squamatus* Cassin of Gaboon, and that this is also the case with *F. ahantensis* Temm. The group thus made is a well-defined one and ranges throughout tropical Africa.

Ammoperdix heyi cholmleyi.

Ammoperdix cholmleyi O.-Grant, Handbook Game-Birds, ii. 1897, p. 293 : Erba Hills, nr. Suakin.

[B. coll.] 11 neighbourhood of Suakin Mch. Apr. May, R.S.; 6 Bir Shigrieb, 1 Bir Terfaur Nov. **Ber.**

[C. & L. coll.] 5 Sinkat Mch. **R.S.**

The above specimens constitute a fine series of these little Partridges. There is also a specimen from Assuan in the Museum collection obtained by Mr. F. S. Worthington, which appears to belong to this subspecies and therefore extends its range northwards into Egypt.

Family STRUTHIONIDÆ.

Struthio camelus camelus.

Struthio camelus Linn. Syst. Nat. 10th ed. 1758, p. 155: Habitat in Syria, Arabia, Lybia, Africa, restricted type-locality North Africa (*vide* Rothschild, Bull. B. O. C. xxxix. p. 83); Butler, Ibis, 1905, p. 401, 1908, p. 263.

[C. & L. coll.] 1 Meshra Zeraf Jan. **U.N.**

According to Mr. Butler, the distribution of the Ostrich is wide in the Sudan. He notes it from the Setit, Dinder, White and Blue Niles, Bahr el Ghazal, and Kordofan.

There is an interesting note in the 'Catalogue of Birds,' vol. xxvii. p. 576, on the reported existence of a diminutive didactyle Ostrich "not higher than *Otis arabs*." It was reported by Mr. Petherick from Kordofan and by Heuglin, though not from personal observation, from near Fazogli. Curiously enough, an identical report reached us fairly recently from the neighbourhood of Lake Rudolf. We know of no other bird unknown to science which already has a vernacular and a scientific name! In 1847, G. R. Gray bestowed the name "*Charadrius bidactylus*" on L'Autruchon of Temminck.

ADDENDA *and* CORRIGENDA.

Ibis, 1918, p. 425. *Corvus umbrinus* should be *Corvus ruficollis* (Lesson, Traité d'Orn. 1830, p. 329: probably Cape Verde Is.), or *Corvus corax ruficollis* if it is regarded as a race of the Raven.

Ibis, 1918, p. 425. *Rhinocorax affinis* should be *Rhinocorax rhipidurus*: *cf.* Hartert, Bull. B. O. C. xxxix. p. 21.

Ibis, 1918, p. 437. *Ploceus vitellinus.* Two more specimens have now been sent by Mr. King from the Lado Enclave, and, though we stated that we could not distinguish Sudanese birds from West African specimens, we are not sure that further material may not enable us to do so, though the newly arrived examples do not agree with Neumann's *P. v. uluensis.* They appear to be distinctly richer in colour, the crown of the males being a richer golden-brown than in any other specimens in the Museum. It may approach *Ploceus reichardi* Reichw., but we have no specimens with which to compare them.

Ibis, 1918, p. 445. *Estrilda cinerea. Fringilla cinerea* Vieillot, 1817, is preoccupied by *F. cinerea* Gmelin, Syst. Nat. i. pt. 2, p. 922, 1789. The next name available appears to be *Estrilda troglodytes* (*Fringilla troglodytes* Licht. Verz. Doubl. 1823, p. 26 : Senegambia).

Ibis, 1918, p. 447. *Lagonosticta rufopicta.* These birds should probably be known as *Lagonosticta rufopicta incerta* (*Lagonosticta incerta* Mearns, Smithsonian Misc. Coll. lvi. 1909, No. 14, p. 6 : Gondokoro). Mr. Sclater has recently examined the types at Washington, and from his description they are identical with the birds in the Butler collection. They differ from typical *L. rufopicta* from the Gold Coast by their greyer, less brown, backs and upper surfaces.

Ibis, 1918, p. 450. *Pytelia melba soudanensis.* With this subspecies we would provisionally identify *Pytelia slatini* Madarasz, Ann. Mus. Nat. Hung. Budapest, xiii. 1915, p. 601. We have only recently seen this memoir.

Ibis, 1918, p. 454. After *Spermestes cucullatus* insert *Amauresthes fringilloides.* A specimen of this bird was sent by Mr. King from Kajo Kaji in the Lado Enclave; it was collected 16 Mch. 1917, and constitutes the first record of this species from the Sudan.

Ibis, 1918, p. 456. *Quelea erythrops.* An adult female of this species was collected at Kajo Kaji in Jan. 1917. This is the first recorded occurrence since Heuglin's specimen mentioned on p. 456.

Ibis, 1918, pp. 456–7. *Pyromelana flammiceps craspedopterus.* According to Lönnberg (Ark. Zool. Stockh. 1918, xii. No. 3), *Loxia hordacea* of Linnæus, 1758, is founded on a specimen of what is known as *Pyromelana flammiceps.* Assuming that Linnæus's specimen came from West Africa, our birds should be known as *Pyromelana hordacea craspedopterus.*

Ibis, 1918, p. 470. *Passer jagoensis cordofanicus.* Lord Rothschild has kindly sent us two examples of the true *P. j. cordofanicus* collected by Baron von Müller's expedition in 1848 in Kordofan, and they differ most strikingly from the Mongalla birds to which we had applied that name. The only characters we need note are that the upper surface is bright rufous chestnut instead of brown or grey-brown, and the dark streaks on the mantle are fewer in number. Our birds must then be called *Passer jagoensis shelleyi* (*Passer shelleyi* Sharpe, Ibis, 1891, p. 256: Lado), though it is worth remarking that the type is a very bright-coloured bird compared with ours.

Ibis, 1918, p. 470. After *Passer domesticus arboreus* should be inserted *Passer hispaniolensis*, which reaches as far south as the Dongola Province in the Nile Valley, and has even been recorded from the Blue Nile.

Ibis, 1918, p. 611. *Motacilla vidua* Sundev. is antedated by *Motacilla aguimp* Dumont, Dict. Sci. Nat. xxi. 1821, p. 226, ex Levaillant: "Orange River." *Cf.* Austral Avian Record, iii. No. 1, p. 14.

Ibis, 1918, p. 612. *Motacilla flava melanocephala* should be *Motacilla flava feldegg* Michahelles, Isis, 1830, p. 812: Dalmatia, as Lichtenstein's name is preoccupied by *Motacilla melanocephala* of Gmelin, 1789. The Yellow Wagtails would be treated of better under the separate generic or subgeneric title *Budytes.*

Ibis, 1918, p. 656. *Cisticola erythrops roseires.* This form is probably identical with *Cisticola nilotica* Madarasz, Ann. Mus. Nat. Hung. xii. 1914, p. 591: Blue Nile, lat. 13° N. If so, the bird must be known as *C. erythrops nilotica* Madarasz.

Ibis, 1918, p. 676. *Prinia mistacea mistacea. Prinia pallescens* Madarasz, Ann. Mus. Nat. Hung. xii. 1914, p. 593: Luieza, Dinder river, is probably only a worn example of *P. m. mistacea.*

Ibis, 1918, pp. 669–670. *Troglodytes micrurus* Rüppell, Neue Wirb. p. 109, pl. 41, was published in 1836, thus antedating *Sylvietta brachyura* of Lafresnaye, 1839, and therefore the name for the group should be *Sylvietta micrura*, not *brachyura.*

Ibis, 1918, p. 682. The name *Cossypha* is preoccupied, *vide* Austral Avian Record, vol. iii. No. 2, p. 43, and the genus should be known as *Bessonornis*.

Ibis, 1918, p. 684. *Thamnolæa coronata kordofanensis.* Major Claude Graham has lately sent home a pair of these fine Chats from near Talodi in the Nuba mountains, and states that they are not uncommon. These are the first examples to reach this country, though it was described by Wettstein in 1916. As we have seen no typical *T. coronata*, we can offer no opinion as to its subspecific distinctness.

Ibis, 1918, p. 685. Add *Saxicola hemprichi.*

Saxicola hemprichi Ehrenberg, Symb. Phys. 1828, fol. AA: Kunfuda, Arabia.

Pratincola maurus apud Reichw. V. A. iii. p. 734.

If this form is really a distinct race breeding in north-west Africa, it must be added to our list, as it is recorded by Madarasz (Ann. Mus. Nat. Hung. xii. 1914, p. 589) from Beida, Dinder river.

Ibis, 1918, p. 690. Add *Œnanthe leucomela cypriaca.*

Saxicola cypriaca E. v. Homeyer, Zeitschr. f. Ges. Orn. i. 1884, p. 397: Cyprus.

This Cypriote so-called resident race also occurs in the Sudan and Egypt, as has been pointed out to us by Mr. Bonhote; the subspecies is distinguished by its rather deeper colour and shorter wing, measuring 84–89 mm. against 94–96 for the typical race.

One of the Khartoum birds mentioned in our list (Ibis, 1918, p. 690) should be referred to *Œ. l. leucomela*, the others all to *Œ. l. cypriaca.*

Ibis, 1918, p. 694. The genus known as *Crateropus* should bear the name *Turdoides*, *vide* Richmond, P. U. S. Nat. Mus. liii. p. 627, note.

Ibis, 1918, p. 700. The genus *Coracina* Vieillot is invalidated by *Coracinus* Pallas, *cf.* Austral Avian Record, iii. No. 3, p. 66, and the species *pectoralis* should be placed in the genus *Graucalus* of Cuvier if it is considered congeneric with *G. papuensis* the type of that genus, and in *Ceblepyris* Cuvier if it is not.

Ibis, 1918, p. 643. *Acrocephalus scirpaceus scirpaceus.* Mr. Witherby has sent us two Reed-Warblers collected by himself at Kawa and Shebesha which he refers to *A. s. macronyx*, the eastern race of *A. scirpaceus*. We agree with his identification, and consider also that the majority of the Butler specimens are probably of this race. It does not seem possible, however, to say exactly to which race any one specimen belongs, but the series are, in colour, paler than the average European birds.

After *A. s. scirpaceus*, therefore, should be inserted *A. s. macronyx* (*Salicaria macronyx* Severtzoff, Turkestan Jevotn. in Izv. Obshch. Moskov. viii. 1873, (2) p. 128 : Sir Darya), and, inasmuch as the Shebesha specimen is the one mentioned on p. 644 under *Acrocephalus palustris*, that species must be deleted from the list.

Ibis, 1918, p. 659. *Hippolais pallida.* Mr. Witherby has very kindly sent us an example of *Hippolais rama* collected by himself on the Nile at Kawa. On further examination we are also inclined to attribute at least four of the Butler birds from Khartoum, and the Chapman and Lynes specimen from Singa, to this species and not to *H. pallida.* This is, of course, a new bird to the Sudanese and probably to the African list. Several birds collected by Alexander at Lake Chad seem also to be nearer *H. rama*, and it will probably be found to have a fairly extensive distribution in Africa. *H. pallida* and *H. rama* are by no means easy to tell apart, and the Sudanese birds in particular do not seem to differ so much as Asiatic specimens.

After *Hippolais pallida*, therefore, should be inserted *Hippolais rama* (*Sylvia rama* Sykes, P. Z. S. 1832, p. 89 : Deccan).

Ibis, 1918, p. 664. *Phylloscopus trochilus trochilus.* Mr. Witherby has sent us three Willow-Wrens from the White Nile which are undoubtedly of the typical form, though Mr. Butler's Khartoum series appear to be mainly *P. t. eversmanni.*

Ibis, 1918, p. 704. *Muscicapa striata.* An example of the eastern race of the Common Flycatcher, *M. s. neumanni* has been sent by Mr. King from Kajo Kaji in the Lado Enclave. Another bird from the same place appears to be of the western form.

Ibis, 1918, p. 704. *Muscicapa collaris* should be *Muscicapa albicollis*, as *M. collaris* Bechstein is preoccupied, *vide* Additions and Corrections to B. O. U. List, Ibis, 1918, p. 239. It seems likely that *M. collaris* and *M. atricapilla* should be separated from *Muscicapa* under the name *Ficedula* Brisson.

Ibis, 1919, p. 631. Under *Yungipicus obsoletus obsoletus*, *Y. o. ringens* is a misprint for *Y. o. ingens.*

Ibis, 1919, pp. 644–5. The names of the emerald-golden group of Cuckoos have been in considerable confusion, both in Latin and in English. They should be as follows:—

	Cuckoo with yellow underparts.	*Cuckoo with white underparts.*
English.	Emerald.	Golden. Copper. Didric.
Latin.	*Cuculus cupreus* Shaw, Mus. Lever. 1792, p. 157. *C. smaragdineus* Swains. B. of W. Afr. ii. 1837, p. 191. *C. intermedius* Hartl. B. of West Africa, 1857, p. 191.	*Cuculus caprius* Boddaert, Tabl. Pl. Enl. 1783, p. 40. *C. auratus* Gmelin, Syst. Nat. i. pt. 1, 1788, p. 421.

On page 644, therefore, for *C. caprius* Bodd. read *C. cupreus* Shaw, and on page 645 for *C. auratus* Gmel. read *C. caprius* Bodd. It would be best also to call the former the Emerald and the latter the Didric Cuckoo. If it is preferred to regard *C. caprius* Bodd. as a misprint for *C. cupreus*, then Shaw's name is invalid and disappears, and the Emerald Cuckoo becomes *C. smaragdineus* Swains. For the races of the Emerald Cuckoo, see Bannerman, Ibis, 1912, pp. 244–7.

Ibis, 1919, p. 648. *Chizærhis zonurus. Crinifer* Jarocki, 1821, replaces *Chizærhis* Wagler, 1827, *vide* Austral Avian Record, iii. No. 6, p. 146.

After *Chizærhis zonurus* should be inserted *Corythaixoides leucogaster*, of which a specimen has been sent home by Mr. King. It was collected at Ikoto near Torit in south-east Mongalla, 17 Feb. 1918, and is an addition to the Sudanese list.

Ibis, 1919, p. 663. *Irrisor erythrorhynchus.* The genus *Irrisor* must be replaced by *Phœniculus* Jarocki, 1821 (*cf.* Austral Avian Record, iii. No. 6, p. 146), and the family Irrisoridæ must become Phœniculidæ.

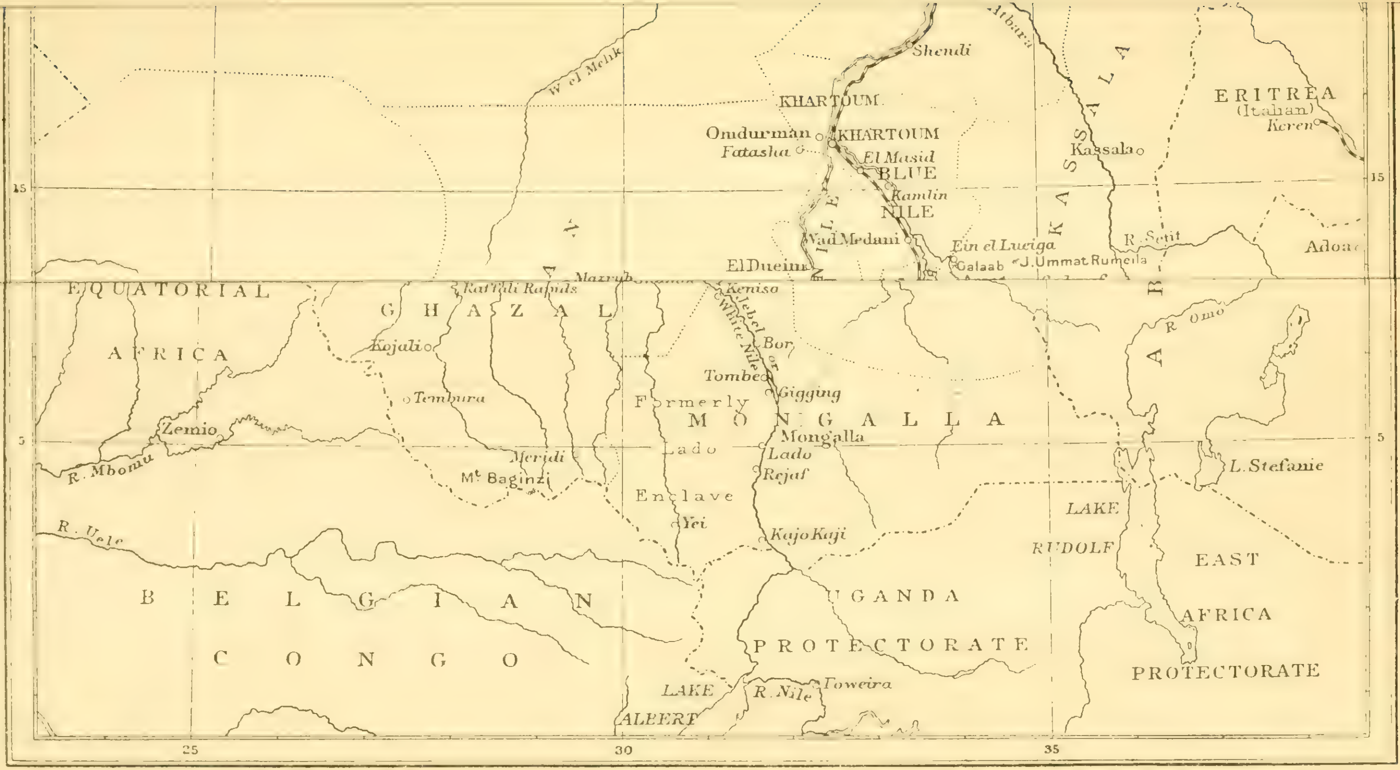
Ibis, 1919, p. 668. Among the Alcedinidæ should be inserted a race of *Alcedo ispida.* Mr. Butler informs us that it occurs commonly in the harbour at Port Sudan, and that a specimen obtained by him was given to the Gordon College Museum. Mr. Butler refers the specimen to *A. i. pallida* Brehm.

Ibis, 1919, p. 675. *Palæornis krameri. Palæornis* should be *Psittacula, vide* Mathews, Birds of Australia, vi. p. 169.

Ibis, 1919, pp. 686–7. For *Tinnunculus* read *Cerchneis. Vide* A. O. U. Check-list of North American Birds, pp. 165–166.

Ibis, 1919, p. 697. For *Aquila rapax albicans* read *Aquila rapax raptor*. The name *Falco* (*Aquila*) *albicans* Rüpp. is preoccupied by *Falco albicans* Gmelin, S. N. i. p. 276, as was pointed out to me by Mr. Iredale. The next available name appears to be *Aquila raptor* A. E. Brehm, Naumannia, 1855, p. 13: Blue and White Niles, of which the type is at Tring.

With regard to the Eagles collected by the Chapman-Lynes expedition in the Red Sea Province, Mr. Abel Chapman has suggested that at least one of the Eagles we have called *A. r. albicans* differs considerably from the others, notably by the length of its legs as compared with the shortness of its tail. It was collected at Erkowit and certainly is unlike most of the *A. r. albicans* in the Museum, being a more compact-looking bird. In this connection we would note that all the dark specimens of *A. rapax* come from the north-eastern corner of Africa, and also that in India there is a race of *A. rapax*, *A. r. vindhiana*, which has a


ERITREA
(Italian)
Keren
KASSALA
Kassala
Adoa
R. Setit
Atbara
Shendi
KHARTOUM
Omdurman
KHARTOUM
Fatasha
El Masid
BLUE
Kamlin
NILE
Wad Medani
Ein el Lueiga
Galaab
J. Ummat Rumeila
El Dueim
W. el Melk
A
WHITE NILE
B
A
R. Omo
Mazrub
Kenisa
Jebel
Bor
or
White Nile
EQUATORIAL
AFRICA
GHAZAL
Raffili Rapids
Kojali
Tembura
Zemio
R. Mbomu
Meridi
Mt Baginzi
Formerly
Lado
Enclave
Yei
Tombe
Gigging
MONGALLA
Mongalla
Lado
Rejaf
Kajo Kaji
L. Stefanie
LAKE
RUDOLF
EAST
AFRICA
PROTECTORATE
UGANDA
PROTECTORATE
R. Uele
BELGIAN
CONGO
LAKE
ALBERT
R. Nile
Toweira
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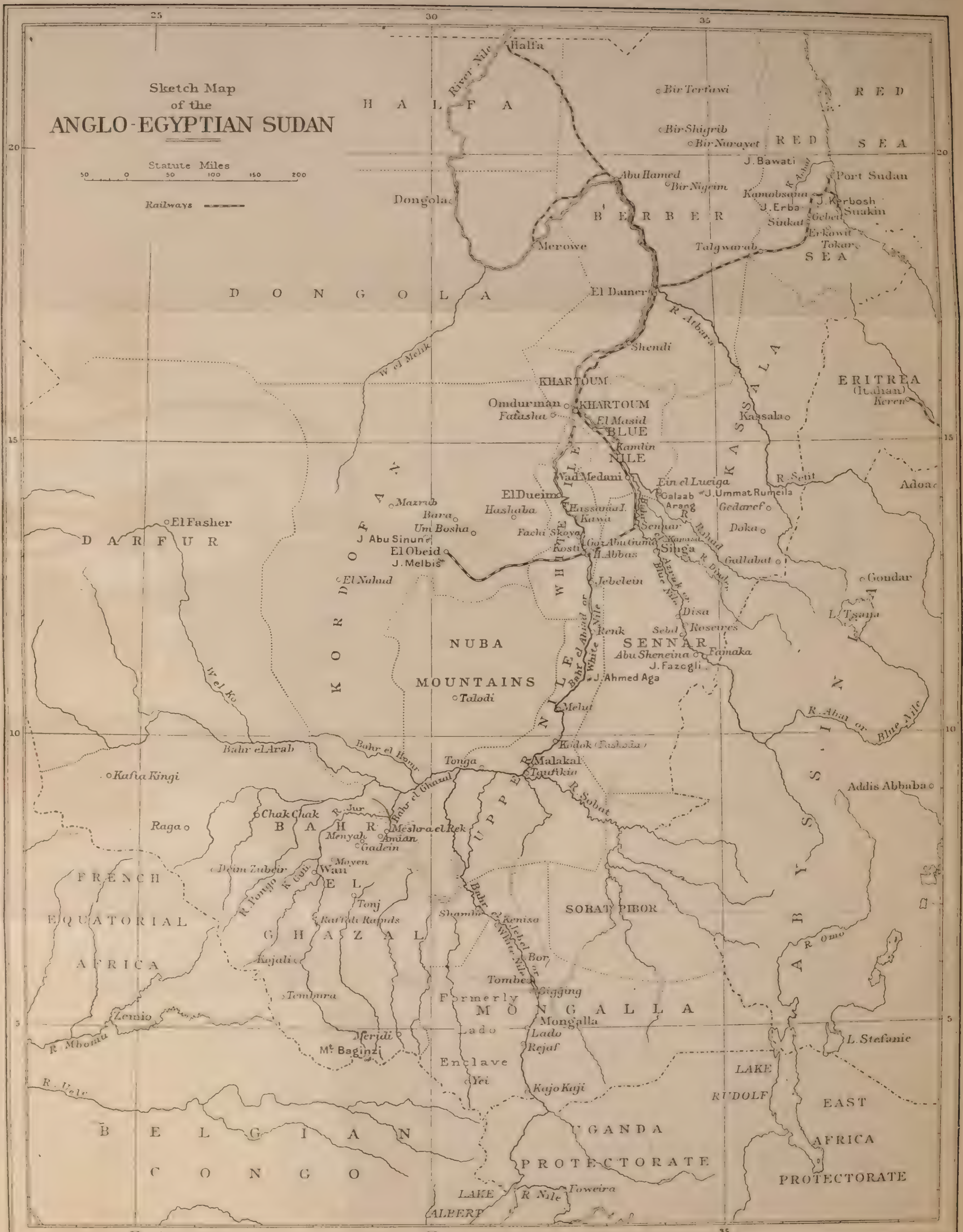

Sketch Map
of the
ANGLO-EGYPTIAN SUDAN

Statute Miles
50 0 50 100 150 200
Railways
25
30
35
20
15
10
5
RED SEA
RED SEA
HALFA
River Nile
Halfa
Bir Tertawi
Bir Shigrib
Bir Narayet
J. Bawati
Port Sudan
Abu Hamed
Bir Nigeim
Kamobsana
J. Kerbosh
J. Erba
Suakin
Gebeit
Sinkat
Erkowit
Tokar
Talgwarab
Dongola
BERBER
Merowe
DONGOLA
El Damer
R. Atbara
Shendi
KASSALA
ERITREA
(Italian)
Keren
Kassala
KHARTOUM
Omdurman
KHARTOUM
Fatasha
El Masid
BLUE NILE
Kamlin
R. Setit
Adoa
W. el Melik
KORDOFAN
Wad Medani
Ein el Lueiga
Galaab
J. Ummat Rumeila
Arang
Gedaref
El Dueim
Hashaba
Eassawa I.
Kawa
Mazrub
Bara
Um Bosha
J Abu Sinun
El Obeid
J. Melbis
El Fasher
DARFUR
Fachi Shoya
Kosti
Senaar
Goz Abu Guma
Singa
R. Rahad
Doka
R. Dinder
Gallabat
Goudar
El Nahud
WHITE NILE
H. Abbas
Jebelein
Azrak or Blue Nile
Disa
L. Tsana
Renk
Sebil
Roseires
SENNAR
Abu Sheneina
Famaka
J. Fazogli
J. Ahmed Aga
NUBA MOUNTAINS
Talodi
Bahr el Abiad or White Nile
W. el Ko
Melut
R. Abai or Blue Nile
ABYSSINIA
Kodok (Fashoda)
Bahr el Arab
Bahr el Homr
Tonga
Malakal
Taufikia
Kafia Kingi
Addis Abbaba
R. Sobat
Bahr el Ghazal
R. Jur
Chak Chak
Raga
BAHR EL GHAZAL
Meshra el Rek
Menyal
Amian
Gadein
Deim Zubeir
Moyen
Wau
R. Pongo
R. Gyi
Tonj
UPPER NILE
FRENCH EQUATORIAL AFRICA
Kat'ah Rapids
Shambe
Kenisa
Bahr el Jebel or White Nile
SOBAT PIBOR
Bor
R. Omo
Kojali
Tombe
Gigging
Tembura
Formerly Lado Enclave
MONGALLA
Mongalla
Lado
Zemio
R. Mbomu
Meridi
Mt. Baginzi
Rejaf
L. Stefanie
Yei
LAKE RUDOLF
R. Uele
Kajo Kaji
EAST AFRICA PROTECTORATE
BELGIAN CONGO
UGANDA PROTECTORATE
LAKE ALBERT
R. Nile
Foweira

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very dark stage of plumage, and is not unlikely to wander to Africa. *A. r. albicans* or rather *raptor* and *A. r. vindhiana* appear to be indistinguishable, except in the fully adult when they are very distinct.

Also on p. 697 under *Aquila rapax albicans* [C. & L. coll.], for 1 Erkowit read 4.

Ibis, 1919, p. 699. *Buteo buteo rufiventer.* According to Richmond, Auk, 1919, p. 549, the earliest name for this species is *Falco rufocanus*, Forster's edition of Levaillant's Oiseaux d'Afrique, 1798, pl. 17. The finding of this little-known work involves also changes in the names of the Jackal-Buzzard and Kolbe's Vulture. In the case of the Desert Buzzard, however, Forster's name is founded, like Daudin's *Falco desertorum*, on Levaillant's plate, and if this is not identifiable as stated by Hartert, the name *Falco rufocanus* is in the same category as *Falco desertorum*, and neither can be used.

To the list of Literature on Sudan Ornithology at the beginning of the first part of the paper should be added the following:—

27. Petherick, J., with notes by H. E. Strickland. List of Birds procured in Kordofan. Proc. Zool. Soc. 1850.

28. Sassi, Dr. Ein Beitrag zur Kenntnis der Vogelwelt vom Weissen Nil. Ann. Nat. Hist. Hof-Mus. Wien, xxi. 1906, pp. 45–59.

29. Madarasz, J. von. A Contribution to the Ornithology of the Eastern Sudan. Ann. Mus. Nat. Hung. Budapest, xii. 1914, pp. 558–604; 1 pl.

30. Wettstein, O. von. Wissenschaftliche Ergebnisse der von F. Werner unternommenen Zool. Exped. nach dem Anglo-Aegyptische Sudan (Kordofan), 1914; ii. Bearbeitung der Vögel und Saugethiere. Denkschr. k. Akad. Wiss. Wien, xciv. 1917, pp. 553–693.

XXXII.—*A Contribution to the Study of Nestling Birds.*

By Collingwood Ingram, *M.B.O.U.*

(Text-figures 1–17.)

There is no branch of ornithology that has remained so long neglected as the study of nestling birds, nor is there one in which so many problems still await solution. Upon close examination, even the young of altricial birds will be found to vary considerably, and often, within the limits of a single family, they display a really remarkable adaptability to the conditions under which their parents breed. The chicks of precocial species are possibly more interesting, for they show still greater versatility, especially in regard to the pattern and texture of their downy covering, but I do not intend to deal with these now. Nor is it my intention to make an exhaustive survey of all my notes on the young of nidicolous species—these have been accumulating for twenty years or more, and have become far too bulky to be adequately condensed into a single paper. The following pages, then, must be regarded as only a small contribution to a very fascinating study, and are offered chiefly with the idea of stimulating further research.

As the terminology of plumage does not appear to be very stable and is not yet in common use, it is perhaps advisable to briefly give a few definitions of the terms I intend to adopt:—

Plumules.—The small downy feathers found in the adults of many birds. Plumules may occur either in the apteria, or in the pterylæ, or in both; but in some species they are completely absent. In the adult individual they are normally concealed by the contour-feathers.

Pre-pennæ.—The small downy feathers that precede, and are afterwards replaced by, contour-feathers. These are found in the young of many birds.

Pre-plumulæ.—The small downy feathers that precede, and are afterwards replaced by, plumules. These are found in the young of many, though not all, the species that possess plumules in adult life. In structure pre-pennæ and pre-plumulæ are often indistinguishable.

Teleoptiles.—A comprehensive term for all contour-feathers. Newton (Dictionary of Birds, p. 243) includes adult down or plumules in his definition of this term, but its application is here restricted to contour-feathers.

Mesoptiles.—Semi-plumous feathers, forming an intermediary plumage or second generation of feathers. These are found in adolescent individuals of a few species (Barn-Owl, etc.) and are acquired between the first generation of nestling down (neossoptiles) and the adult plumage of contour-feathers (teleoptiles), and the term is here used in this restricted sense. Pycraft does not thus confine its application, but uses the word for all the forms of nestling-down immediately preceding teleoptiles. His assumption seems to be that all nestling birds originally developed two distinct generations of pre-pennæ down and that in the majority of species the first generation (which he calls "protoptiles") has now been suppressed *.

Neossoptiles or Nestling-down are comprehensive terms used in this paper to denote the existing first generation of down-feathers, and is applied to these whether succeeded by mesoptiles or directly followed by teleoptiles, or whether pre-pennæ or pre-plumulæ.

Fig. 1, showing the pterylæ of the neossoptiles in a nestling Pied Wagtail (*Motacilla lugubris*), gives the nomenclature I intend to adopt for the different down tracts mentioned in this paper. It will be noticed that this nomenclature differs only slightly from that used by Ticehurst (Brit. Bds. Mag. vol. ii.), and later by Witherby in his 'Practical Handbook of British Birds.' For reasons already explained (Brit. Bds. Mag. vol. xiii. p. 78), I have substituted "capital tract" for their "inner supraorbital tract," and have dropped the prefix in their so-called "outer supraorbital tract."

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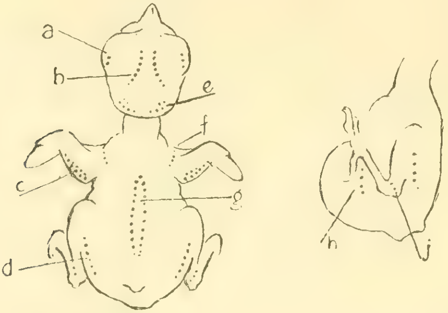
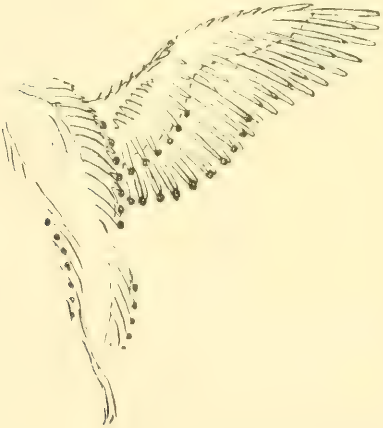
* A study of the nestling plumage of some of the Raptores suggests that, in some cases at any rate, it is the second and not the first generation of nestling-down that has been suppressed (*cf.* fig. 17, p. 875).

Text-figure 1.



Pied Wagtail (*Motacilla lugubris*), 1 day old. *a*, Supraorbital tract; *b*, Capital tract; *c*, Ulnar tract; *d*, Femoral tract; *e*, Occipital tract; *f*, Humeral tract; *g*, Spinal tract; *h*, Ventral tract; *j*, Crural tract.

Text-figure 2.

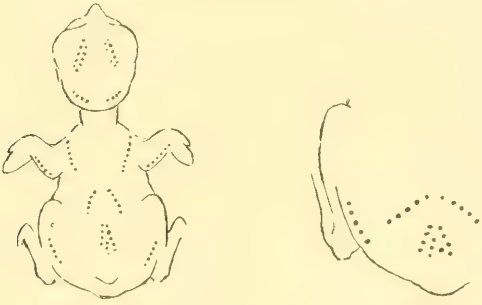


Wing of Pied Wagtail (*Motacilla lugubris*), about 8 days old, to illustrate how the ulnar tract of neossoptiles is carried on the proximal feathers of the greater and median coverts.

Neossoptiles, whether pre-pennæ or pre-plumulæ, may be carried on the extremities of the succeeding feathers either (1) as a complete tuft, *i. e.*, with the barbs united at a common base, or (2) disintegrated, *i. e.*, with individual down barbs adhering to the tips of individual teleoptile barbs. Both cases may occur in the same bird.

In Passerine species the neossoptiles usually, though not invariably, retain the form of a tuft. These tufts precede, and are afterwards carried on, the tips of only a few, definitely distributed, contour-feathers. In the case of the Pied Wagtail figured, the down-tufts forming the ulnar tract are subsequently borne on the innermost median and greater wing-coverts. As these contour-feathers grow and increase in length, what originally appeared to be a single tract of down-tufts becomes divided into two distinctly separated lines* (see fig. 2).

Text-figure 3.



3 A. Skylark, 2 days old. 3 B. Hind part of a Skylark (*Alauda arvensis*), about 7 days old. Note how in fig. 3 B the angle formed by the double row of neossoptiles becomes more obtuse as the teleoptiles develop.

Along the humeral tract the down-tufts precede, and afterwards adhere to, the outermost and hindmost scapular feathers, but it is interesting to note that those occurring on the spinal tract are not marginally situated when the contour-feathers appear. As these latter grow the down-tufts are carried on their extremities and are forced relatively lower down the back (*cf.* figs. 3 A and 3 B).

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* Incidentally it may be remarked that the feathers forming what might be aptly termed the secondary coverts (*i. e.*, the proximal section of what are collectively known as greater coverts) grow before the secondaries and at one stage of the fledgeling period exceed them in length. Ticehurst and others have been deceived by this, and have stated that the down-tufts occur on the secondaries instead of secondary coverts. In some species—Crows, for instance—vestigial down may be detected on the remiges, but this is so minute and degenerate that it has been ignored in most of the accompanying figures.

As the time approaches for the Passerine fledgeling to leave its nest, the neossoptiles are shed by abrasion. Those subject to the greatest amount of friction—*i. e.*, on the ventral and femoral tracts—disappear first, while those on the head, owing presumably to the fact that they cannot be reached when the bird is preening its plumage, are generally retained the longest*.

It is my belief that the downy integument found in the majority of Passerine nestlings is not, as some would suggest, a functionless ancestral inheritance, but is usually of real service to the species possessing it. Its principal purpose seems to be undoubtedly that of concealment, although the retention of heat in the body is probably an important secondary use.

In some cases the obliterative effect of this downy covering is really remarkable, and it is certainly curious that this fact has not been commented on before. Take, for instance, the helpless young of Passerine species nesting in deep recesses, such as concavities in a bank, under overarching tufts of grass, or, again, in dense and low herbage. These are almost always clothed in a loose down of a dusky neutral grey or blackish colour. When in repose a nestful of such birds, huddled together, counterfeit with extraordinary fidelity a patch of deep shadow. In fact, I do not think it conceivable that there could be any more perfect device for reproducing the effect of depth without form, than this downy mass with its appearance of filmy darkness. In other words, the shadows of the natural recess in which the nest is ensconced remains virtually undisturbed, and the chance of detection is reduced to a minimum. Good examples may be found among the Pipits, Buntings,

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* In a domestic fowl that had one of its legs injured as a chick, so that it was incapable of scratching its head, I noticed that the neossoptiles on the crown were retained for many months.

Accentors, Tree-creepers, Robins, and in the Nightingale and Stonechat.

On the other hand, it will be noticed that the young of altricial species nesting in more open situations, either on the level ground or among the looser vegetation of shrubs and low trees, are generally covered with down of a very much lighter shade. A moment's reflection will, I think, explain the reason for this. In such positions, it is obviously an advantage to neutralize, rather than intensify, the depth of shadow in the nest-cup.

With a few exceptions among arboreal species, the down varies in colour from smoke- or drab-grey in birds that select moderately low sites (*i.e.*, Chaffinch, Greenfinch, Linnet, Blackbird, Song-Thrush, etc.), to white or whitish in those that nest in higher and still lighter positions (Hawfinch, Goldfinch, Golden Oriole, Mistle-Thrush, etc.*). It is also significant to note that in these latter species the down is generally more profuse—compare, for instance, the Mistle-Thrush with the Song-Thrush or Blackbird, or the Hawfinch with the Linnet.

With ground-nesting birds (*i.e.*, Field-Wagtails and Larks), that build their nurseries on a level surface, and therefore more or less open to the sky, the down is generally distinctly more sandy in hue. This colour assimilates equally well with the sun-dried ground of sterile districts or the parched stems that are found near the roots of all kinds of grassy vegetation. In the case of some of the Larks, the assimilation is not due to colour alone, but is considerably assisted by a special modification of the down-feather. A good example of this can be found in the Common Skylark (*Alauda arvensis*). Upon comparing the nestling-down of this species with that of most other Passerine birds, it will be noticed that it appears very coarse in texture. This is caused by the relative thickness of the pale straw-coloured barbs. In many cases the barbs composing the down-tufts are fused together in couples at about half their length, and thus form a single thickened extremity* (fig. 4). These pale extremities, backed by slightly darker bases and darker skin, are very effective, and enable a brood of young Skylarks to become almost invisible at a distance of only a few feet. When immobile their downy covering almost exactly reproduces a plexus of withered grass-leaves.

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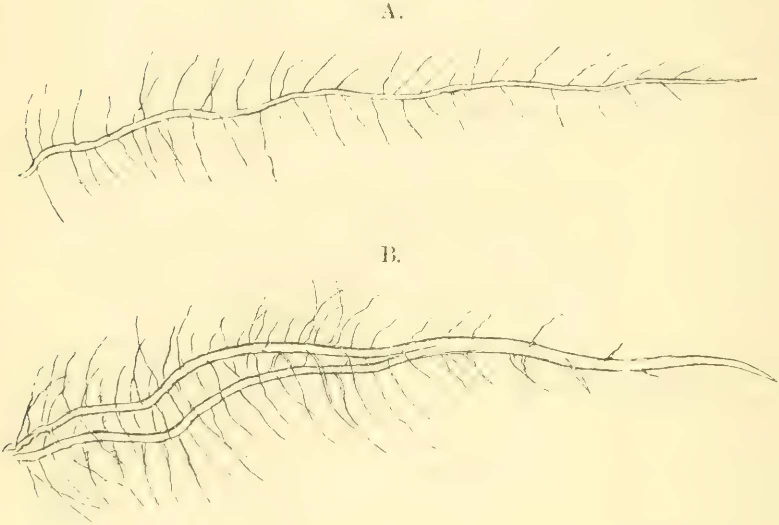
* An apparent exception to this rule occurs in the Crossbill. According to Ticehurst, the nestling-down of this bird is very dark grey. Although nesting high, I believe it usually builds in rather dense branches of dark-leaved conifers, in which case the downy covering may still be regarded as procryptic.

Text-figure 4.



A. Single barb from the neossoptile of a Yellow Wagtail (*Motacilla raii*).

B. Fusion of two barbs in the neossoptile of a Skylark (*Alauda arvensis*).

Excluding the larger forms of altricial birds, such as the

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* A similar union of the barbs produces the curious "wiry" appearance of the pre-pennæ down on the head of some of the Herons. In the Purple Heron, for instance, three or four of the down barbs become fused together for the greater part of their length, forming a single horny ribbon, evidently to assimilate the coarser type of vegetation amongst which this species breeds.

Owls or Pigeons, it is a fairly general rule to find that the species nesting in deep holes or in completely covered nests (where, of course, no special protective scheme is required) are usually quite naked when hatched, *i. e.* House- and Tree-Sparrow, Long-tailed Tit, Magpie, Kingfisher, Woodpeckers, and Swift. When this is not the case, a marked reduction in the density and distribution of the down is generally observable. There also seems to be a tendency for the down-tracts to disappear from all save the more exposed anterior portions of the body in species that attempt to rear a big family in a more or less confined space. A very good example of this may be found in the two forms of Tree-Creepers (*Certhia brachydactyla* and *C. familiaris*). These birds construct a small, but deeply cupped nest, which is generally wedged into a very narrow crevice. In consequence of this, the relatively large brood (Tree-Creepers lay from six to nine eggs) always have restricted accommodation, and the young birds are almost invariably crowded together in such a way that only their heads are exposed to view. A body-covering of down would therefore be useless, but in order to conceal their heads and to obliterate the symmetrical shadows of the nest-cavity, the crown is adorned with a profusion of greyish-black down (figs. 5 & 6). A similar distribution, to which the same explanation may be applied, occurs in the Goldcrest (*Ticehurst*). In the

Text-figures 5 and 6.

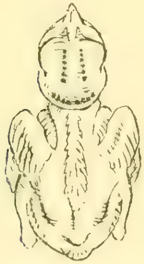

Fig. 5.—Tree-Creeper (*Certhia familiaris*), about 7 days old.

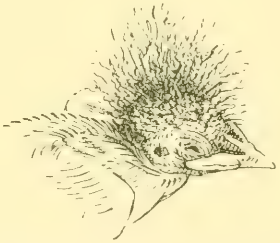

Fig. 6.—Tree-Creeper (*Certhia familiaris*), about 7 days old; side view of head.

Titmice (*i. e.* Great, Marsh, and Blue Tit), although the humeral and spinal tracts are represented, these are considerably abbreviated, and the latter is usually reduced to a few tufts in the centre of the back (fig. 7 *).

As I pointed out in 1907 †, it is usual with Passerine birds nesting in holes, or in dark places, to find that the flanges of the gape are much enlarged. These have a conspicuous swollen and wax-like appearance, and their purpose is almost certainly to guide the feeding parent. An interesting example of the development of this feature may be found in the Jackdaw (*Corvus monedula*), which is the only member of the British Corvidæ that nests in deep holes. In most other Crows—the Rook and Carrion-Crow, for example—the gape is very much smaller and quite inconspicuous, for the flanges become darkly pigmented soon after hatching and long before the swollen process is absorbed (see fig. 10).

Text-figures 7, 8, and 9.

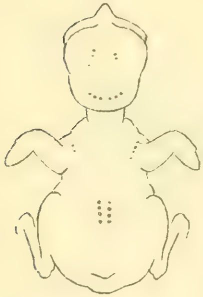

Fig. 7.—Marsh-Tit (*Parus palustris*), about 3 days old.

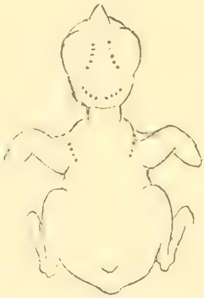

Fig. 8.—Willow-Warbler (*Phylloscopus trochilus*).

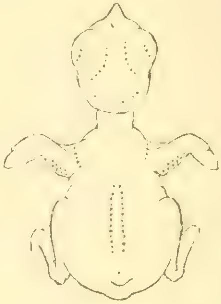

Fig. 9.—Yellow Wagtail (*Motacilla f. raii*), about 2 days old.

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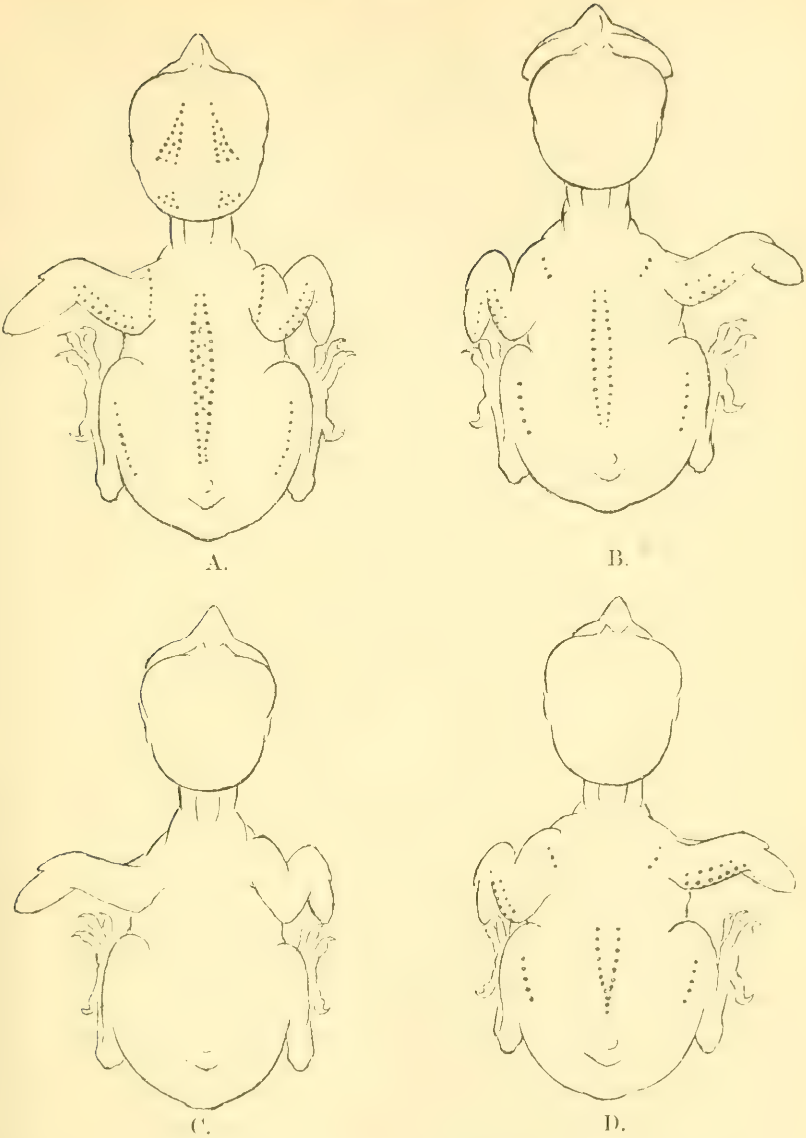
* Compare this with the down pterylosis of the Carrion-Crow, Wagtails, etc., viz., species that are not usually crowded into a confined space when hatched.

† "Tongue-marks in Young Birds," Ibis, 1907, p. 576. This paper, by the way, was in the hands of the editor about seven months before it was published, and it was written some eight months before the appearance of Pycraft's first paper on "Young Birds," in Brit. Bds. Mag. (vol. i.).

Text-figure 10.



Diagrams to illustrate variation in the same family.

A. *Corvus corone*: down plentifully distributed, but not very long, greyish-white in colour; about 3 days old.

B. *Corvus monedula*: down-tracts somewhat abbreviated, absent from head; greyish-white in colour; large wax-like flanges to the gape; breeds in semi-obscurity; about 4 days old.

C. *Pica pica*: down absent; breeds in a domed nest, and is therefore protected from above; about 3 days old.

D. *Corvus frugilegus*: down absent from head; smoky grey; gape-flanges inconspicuous; one day old.

In Picarian birds, on the other hand, I believe there is seldom, if ever, any conspicuous enlargement of the rictus, even when a species nests in dark or semi-obscure situations. An explanation of this apparent anomaly will probably be forthcoming when we more thoroughly investigate their mode of conveying food to their young. I believe the explanation lies in the fact that the majority of these birds feed their young—during the earlier stages, at any rate—by regurgitation. This is almost certainly the case with the Common Swift (*Micropus apus*), whose naked nestlings are hatched in obscure situations without a vestige of any gape-flange. Despite long vigils in dark and dusty attics, I have never succeeded in actually seeing Swifts feed their young (which, by the way, they do at very long intervals of time), but, from the actions of the parents and the groping movements of the nestlings, I have no doubt that they are nourished in their infancy entirely by regurgitation *. This being so, a visual stimulus is scarcely necessary, since the transference of food can be safely accomplished immediately contact is obtained between the mouths of the giver and receiver, and this contact is probably obtained more often by a sense of touch than by sight.

While referring to the nestling Swift it might be worth while mentioning an interesting habit I noticed last year, when handling a young bird about three or four days old. This individual, evidently feeling ill at ease in the hollow of my hand, evinced a strong and unmistakable desire to climb upwards. It was apparent that this instinct was excited by the irregular surface upon which it found itself, and I have no doubt its function is to enable the nestling to retain its position on the shallow platform that does duty for a nursery. But its method of climbing (or rather its attempt to climb, for it was not very successful) seemed to me the point of chief interest. Gripping very vigorously with its claws, and waving its naked wings in an obvious endeavour to use these as subsidiary levers, it tried to hoist itself upwards by hooking its bill on to the edge of my finger. The violence of the muscular effort was evidenced by the way its whole physiognomy became contorted and its jaws stood out from the side of its face as sharp protending angles. A surprisingly good hold was obtained by the tip of the lower mandible, which appeared to be slightly decurved at its extremity. This nestling repeated these attempts to climb at intervals until it became too exhausted to make any further effort.

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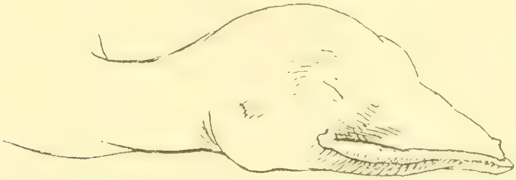
* Nightjars have been proved to feed their young by regurgitation (Kirkman, 'Wild Life,' vol. iii.) Swifts are said to convey food to their nestlings in the form of "bundles" of insects carried under their tongue (Kirkman, 'British Bird Book,' ii. p. 360). This fact was recorded also by Gilbert White in a letter to Barrington dated Sept. 28, 1774.

Although the nestling Wryneck (*Iynx torquilla*) agrees with other Picarian species in being without conspicuous rictal flanges, when hatched the tomia of the mandibles do not coincide as in the Swift, Nightjar, etc. During early infancy the lower mandible is appreciably larger than the upper. This member not only protudes beyond the tip of the maxilla, but has a comparatively large swollen process running along its posterior edge (fig. 11). A possible use for this curiously formed mandible may be found when the young Wryneck's food is examined. I believe I am right in saying that the parents feed their young very largely, if not exclusively, upon quantities of ants which are carried to the nesting-hole in the throat and bill. It is obvious that a proportionately large, shovel-like mandible would greatly facilitate the safe transference of these bundles of small insects and would minimize the chance of their being spilled and wasted. The bill acquires its normal shape before the bird is fully fledged.

Text-figure 11.



Wryneck (*Iynx torquilla*), newly hatched, to show large lower mandible.

The remarkable heel-pads found in nestling Wrynecks and certain other species (*i. e.*, Barbets, Toucans, and Woodpeckers) have already been commented upon by other writers, and I think Pycraft's interpretation of their use—namely, to protect the young bird from injury in its unlined nest-cavity—is undoubtedly a correct one *. It is interesting to note that incipient heel-pads may also be detected in newly-hatched specimens of the Common Starling (*Sturnus vulgaris*).

Besides those already mentioned elsewhere, neossoptiles are wanting in some, or in all, the species of the following genera:—*Hypolais*, *Acrocephalus*, *Sylvia*, *Garrulus*, *Panurus*, and *Cuculus*. As the young of most of these are reared in open nests and some of the species are small and feeble, the complete disappearance or non-development of a procryptic nestling plumage is somewhat difficult to explain.

At one time I thought the Shrikes (Laniidæ) were also destitute of neossoptiles when hatched, but quite recently I discovered small pre-pennæ in four- or five-day-old specimens of the Red-backed Shrike. Apart from very degenerate and insignificant down on the tips of the main wing-feathers these pre-pennæ were confined to the posterior third of the ventral tract, and were attached to seven or eight of the teleoptiles forming the median row of that tract (fig. 16). I do not know of any other birds with a similar down-pyterylosis.

Fig. 10 illustrates the remarkable variation in nestlings that may occur within the limits of a single family. It will be noted, however, that most of these differences are consistent with the theories and explanations given above. The Carrion-Crow (*Corvus corone*), building in more or less elevated positions, has its nestling well furnished with greyish-white down. With the Rook (*C. frugilegus*) there is less necessity for concealment, as the bird breeds in colonies. Consequently the neossoptile plumage has degenerated somewhat and is now completely absent from the head. The disappearance of down from this area is no doubt an advantage to a gluttonous feeder like the young Rook, and I think the same remark may also be applied to the nestling Jackdaw *. The fact that the Jackdaw's eggs are still coloured, and that the down persists in the nestling, is certainly evidence that the bird has taken to breeding in dark places at a comparatively recent date. This being so, the development of such large gape-flanges is very interesting, and illustrates, I think, the importance of these guiding processes to species nesting in dark or semi-obscure situations. The Magpie builds a nest completely screened from above; a procryptic plumage for its helpless young is therefore unnecessary, and the nestlings are consequently quite naked when hatched. This explanation does not apply, however, to the Jay, whose young are hatched in an open nest and who are also without any downy covering. Possibly the keen vigilance and boldness of the parents, and the fact that the nestlings are almost continuously brooded during the earlier stages, in a measure obviates the necessity for a procryptic neossoptile plumage. But with the Jay, and to a lesser degree with the Magpie, the young are no doubt partly camouflaged by the curious greenish colour of the skin, the upper parts of the nestling Jay being of a distinct olive-green hue.

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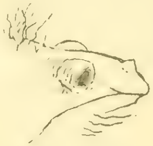
* Beebe ('Tropical Wild Life') describes and figures the nestling Aricari Toucan (*Pteroglossus aricari*). The young of this species has very well-developed heel-pads. Upon these and the hind part of the body they apparently rest "with their feet and toes held up helplessly in mid-air."

Text-figure 12.



Nightjar (*Caprimulgus europæus*), 4 days old; compare with figure of the embryo (p. 870) and note appreciable reduction of the nasal excrescences.

In 1915 I discovered a four-day-old nestling Nightjar (*Caprimulgus europæus*) and made notes and sketches of the peculiar cup-shaped form of its nostrils (fig. 12). This

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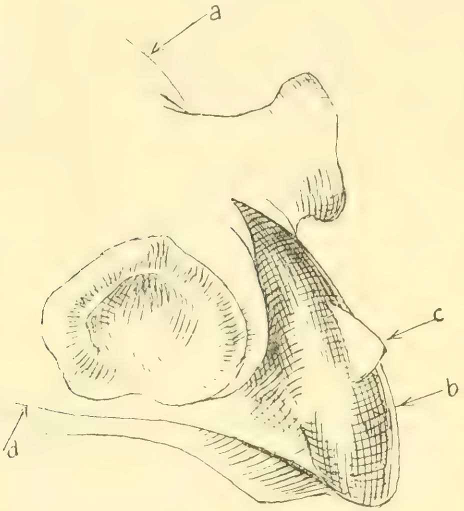
*. *Cf.* reduction of down on facial area in Shearwaters, Petrels, etc. (p. 874).

summer I had the opportunity of examining a fully-developed embryo of this species, and was surprised to see that this superficial enlargement of the nasal organs was even more pronounced. At this early period of its existence the Nightjar's nostrils protrude from either side of the bill like two small snouts. Under a magnifying-glass the conch-shaped apertures of these truly remarkable flesh-coloured protuberances appear to have a rounded and slightly swollen lip. A rough idea of their shape may be obtained from the accompanying figure (fig. 13) which is much magnified, and was drawn direct from the fresh specimen *.

Text-figure 13.



Nightjar (*Caprimulgus europæus*); head of the embryo much enlarged to show the remarkable superficial enlargement of the nasal organs. *a*, fleshy portion of the maxilla; *b*, horny portion of the maxilla; *c*, egg-tooth; *d*, commissure of bill.

The fact that these nasal excrescences are quickly absorbed and disappear during adolescence suggests a no longer useful ancestral function. What this may have been, with my present knowledge, I cannot even guess. I do not think it probable that it has any connection with the position of the embryo in the egg, although, so far as my experience goes, this is somewhat unusual. The head is tucked down in such a way that the bill and nostrils are

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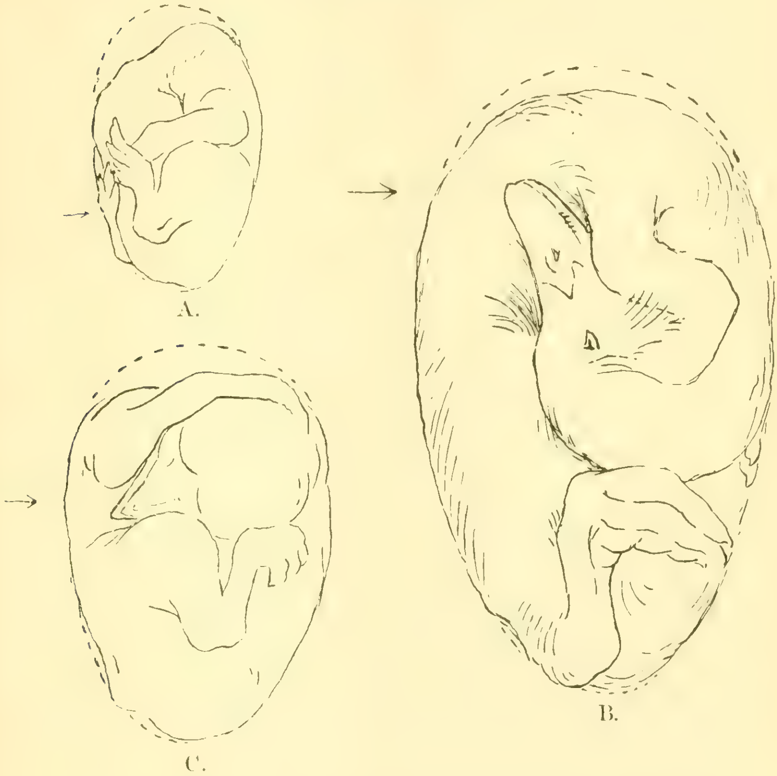
* The Dusky Nightjar (*C. nigrescens*) has "knob-like nostrils" or "rounded fleshy protuberances" in the advanced embryo stage according to Innes Hartley ('Tropical Wild Life,' p. 324).

Text-figure 14.



To show position of embryos within the egg. The arrows indicate the point at which the shell is first chipped.

A. Nightjar (*Caprimulgus europæus*).

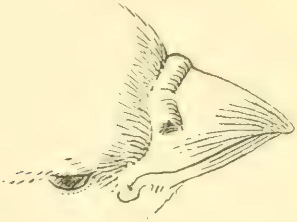
B. Eider-Duck (*Somateria mollissima*).

C. Rook (*Corvus frugilegus*). This position is more or less typical of most Passerine birds.

considerably below the longitudinal centre of the egg, and, therefore, relatively far removed from the air-space in the cap. In most birds—at any rate, in those laying eggs of a true ovate form—the position of the curled-up head causes the bill to be well above the longitudinal centre, and the chick usually chips the shell somewhere about the egg's broadest diameter (fig. 14).

The young Hawfinch (*Coccothraustes coccothraustes*) also appears to have peculiar nostrils. In a newly-fledged specimen that I examined in 1917 I noticed that there were two ridge-like bosses on the bill, running inwards and slightly backwards from the nasal apertures (fig. 15). In this connection it would be very instructive to examine an embryo of this Finch, but unfortunately up to the present I have not had the opportunity of doing so *.

Text-figure 15.



Immature Hawfinch (*Coccothraustes c. coccothraustes*), to show the peculiar nasal ridges.

In the young of raptorial birds the nestlings are hatched more or less evenly covered with down, composed apparently of both pre-pennæ and pre-plumulæ. This downy covering, as is well known, is usually of a uniform colour (generally white or buffish-white), but in a few members of this order a distinct pattern may be observed, and this is especially remarkable in the Osprey (*Pandion haliaëtus*). In a newly-hatched specimen of this bird, the short dense growth of down is sandy buff on the head with a light median stripe running down the nape, and a dark patch in front and behind the eye, while the back is dusky smoke-brown with a very conspicuous dorsal streak of pale sandy buff. The under parts are creamy white. At this stage the dark areas on the sides of the back have a somewhat mottled appearance, and this is seemingly due to the larger pre-pennæ showing through darker brown pre-plumulæ. As is usual in Raptores, when the nestling commences to grow, plumules begin to appear over most of the body. These, instead of being snowy-white as in the Eagles, Falcons, Sparrow-Hawks, etc., are of a smoky-brown colour on the breast and under surface generally. The new growth of down is noticeably darker than the previous generation of pre-plumulæ carried on its tips. Conversely, in the nape and centre of the back the sprouting plumules are lighter, if anything, than the preceding pre-plumulæ, the result of this being an accentuation of the contrasting colours. The nestling Lammergeyer (*Gypaëtus barbatus*) is also remarkable in having a patterned garb, but

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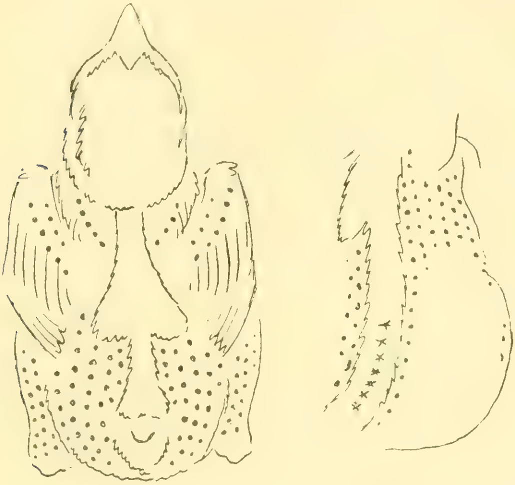
* Enlargements of the external nostrils occur also in the nestlings of some of the Parrots (*cf.* Pycraft, Avicult. Mag. v. 1907, p. 270).

Text-figure 16.


A. B.

Red-backed Shrike (*Lanius collurio*), 5 days old. A. Dorsal aspect. B. Ventral aspect, to show distribution of plumules (•) and pre-pennæ (*).

in this case the dark areas are confined to facial markings, there being a distinct greyish-brown patch on either side of the head (*cf.* the blackish facial markings in the adult). As in the Osprey, Vultures, Owls, etc., the neossoptile plumage of the newly-hatched Lammergeyer is short and dense.

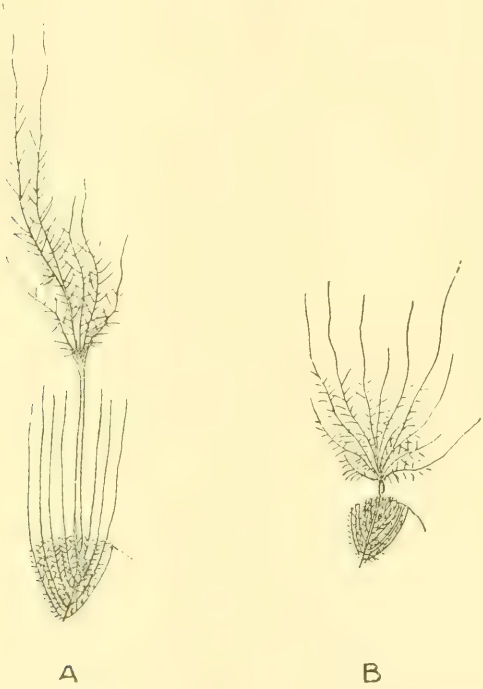
In the Kites, on the other hand, the first downy covering is quite silky and filamentous in appearance, this being due to the prolongation of the golden-buff barbs and the fact that the barbules are more or less restricted to the bases of the feathers. Later on, this buff-tinted neossoptile plumage is superseded and almost entirely eclipsed by a profuse growth of white plumules, through which the dark teleoptiles ultimately sprout.

This precocious appearance of the plumules is not confined to the Falcons and Hawks. Plumules are developed contemporaneously with the teleoptiles in nestling Sand-Martins, Rooks, Shrikes (Laniidæ), and many other species. In these latter birds they are fairly conspicuous owing to their being white or whitish, but of course they are never so pronounced as in the Hawks, nor are they so generally distributed over the body (fig. 16).

The most profuse neossoptile plumage is probably found in the Shearwaters, Petrels, and allied families. In these birds the nestlings are completely covered (with the exception of the face and throat) with a dense mass of long, loose, and very soft down. This covering appears to be composed chiefly of pre-pennæ, but I have detected smaller pre-plumulæ in half-grown specimens of some of the Shearwaters. On the forehead, sides of the face, and throat the down is either reduced to a few filamentous feathers or else is very short and velvety in texture. A similar reduction of down on the facial areas may be noticed, I believe, in all birds that feed their young by regurgitation, i. e., *Phalacrocorax*, *Sula*, *Phœnicopterus*, *Columba*, *Turtur*, etc.—the reason for this being obvious.

In contradistinction to the Passeres, with the nestling Petrels and Shearwaters the down is retained longest on the under surface, and it is a common thing to find specimens with a thick wad of down remaining on the breast when it has entirely disappeared from all the other portions of the body. This is doubtless explained by the fact that the contour-feathers are rather more precocious on the upper parts; the downy tips to the barbs are therefore sooner subjected to abrasion and are consequently moulted first.

Text-figure 17.



Pre-pennæ from a young Goshawk (*Astur palumbarius*), three-parts grown.

A. Secondary feather, with pre-pennæ adhering to filamentous prolongations of the barb. This probably illustrates the three generations of plumage—protoptile, mesoptile, and teleoptile.

B. Feather from the crown of the same bird, with pre-pennæ sessile on the extremity.

If we examine partially-fledged specimens of some of the Raptores, we will find that in many cases the distal barbs of

Table showing Distribution of Neossoptiles in some British altricial Birds.

Species.	Head.			Humeral.	Ulnar.	Spinal.	Femoral.	Crural.	Ventral.	Colour.	Quantity and quality.	Source of information.
	Supra-orbital.	Capital.	Occipital.									
Corvus corax	...	...	+	+	+	+	+	...	+	Mouse-brown.	Plentiful.	Witherby (from skin) and Dunlop.
C. cornix	...	+	+	+	+	+	+	...	...	Drab-grey.	Fairly plentiful.	Ingram (from skin).
C. corone	...	+	+	+	+	+	+	...	...	Greyish-white.	Fairly dense, but not very long.	Ingram.
C. frugilegus	...	...	...	+	+	+	+	...	...	Smoky-grey.	Not very profuse.	Ingram.
C. monedula	...	...	...	+	+	+	+	...	...	Pale greyish.	Not profuse.	Ingram.
Nucifraga caryocatactes	...	+	?	+	?	?	?	...	...	Buffish-white.	?	Ingram (from skin).
Sturnus vulgaris	...	+	+	+	+	+	+	+	+	Smoke-grey, becoming greyish-white on lower portion of spinal tract.	Plentiful; fairly long.	Ingram.
Oriolus oriolus	+	+	+	+	+	+	+	...	+	Sandy- or buffish-white.	Plentiful, but not very long.	Ingram.
Coccothraustes coccothraustes	...	+	+	+	+	+	+	+	+	Snow-white.	Plentiful; long.	Ticehurst.
Chloris chloris	...	+	+	+	+	+	+	+	+	Greyish-white.	Moderately thick and fairly long.	Ingram.
Carduelis carduelis	+	+	+	+	+	+	+	+	+	White.	Moderately thick and rather long.	Ingram.
C. linaria cabaret	...	+	+	+	+	+	+	+	+	Pale smoky-grey, white at base.	Moderately thick.	Ingram.
C. cannabina	...	+	+	+	+	+	+	+	+	Smoke-grey.	Moderately thick.	Ingram.
Pyrrhula p. pileata	...	+	+	+	+	+	+	+	+	Blackish-grey.	Abundant and long.	Ticehurst.
Loxia c. curvirostra	+	+	+	+	+	+	+	+	+	Very ark grey.	Plentiful; fairly long.	Ticehurst.

Fringilla coelebs	+	+	+	+	+	+	+	+	+	Pale greyish-buff.	Tolerably thick.	Ingram.
F. montifringilla	+	+	+	+	+	+	+	+	+	White.	...	Ticehurst.
Emberiza calandra	...	+	+	+	+	+	+	...	...	Drab-buff.	Fairly plentiful.	Ingram.
E. citrinella	..	+	+	+	+	+	+	?	?	Smoky-grey.	Plentiful.	Ingram (Ticehurst includes crural and ventral tracts. In my specimens these were possibly worn off in both species).
E. schoeniclus	...	+	+	+	+	+	+	...	...	Greyish-black.	Fairly plentiful.	
Plectrophenax nivalis	...	+	+	+	+	+	+	+	...	Dark grey.	Fairly long.	Ticehurst.
Galerida cristata	.	+	+	+	+	+	+	...	...	Uniform pale yellowish-buff.	Abundant and fairly long.	Ingram.
Alauda arvensis	..	+	+	+	+	+	+	..	+	Straw-colour, slightly darker, neutral buff at base.	Abundant and fairly long.	Ingram.
Eremophila alpestris	.	+	+	+	+	?	+	+	...	Pale straw-colour.	Long.	Witherby (from skin).
Anthus trivialis	+	+	+	+	+	+	+	+	+	Dark smoke-grey.	Fairly long and plentiful.	Witherby.
A. pratensis	+	+	+	+	+	+	+	+	+	Dingy grey.	Moderately long and plentiful.	Ingram.
A. cervinus	+	+	+	+	+	+	+	+	...	Greyish-black.	...	Ticehurst (spirit-specimen).
A. spinoletta petrosus	+	+	+	+	+	+	+	+	+	Smoke-grey.	Fairly long and moderately plentiful.	Ingram.
Motacilla flava	+	+	+	+	+	...	...	...	...	Creamy-buff or biscuit-colour.	Moderately long and plentiful.	Ingram.
M. f. raii	+	+	+	+	+	...	...	?	...	Pale sandy-buff.	Moderately long and plentiful.	Ingram.
M. cinerea	+	+	+	+	+	+	+	+	...	Golden-buff.	Fairly long.	Witherby.
M. alba lugubris	+	+	+	+	+	+	+	+	+	Smoky drab-grey.	Moderately long and fairly plentiful.	Ingram.
Certhia familiaris brittanica	...	+	+	..	...	...	...	...	...	Greyish-black.	Profuse and long.	Ingram.
C. brachydactyla	..	+	+	...	...	...	...	...	...	Dark smoky-grey.	Profuse and long.	Ingram.

Species.	Head.			Humeral.	Ulnar.	Spinal.	Femoral.	Crural.	Ventral.	Colour.	Quantity and quality.	Source of information.
	Supra-orbital.	Capital.	Occipital.									
Tichodroma muraria	...	+	?	?	?	+	..	...	...	Greyish-drab.	Fairly long.	Ingram (dry skin).
Sitta europæa	...	+	?	?	?	?	?	?	?	Pale greyish-drab.	Scanty ?	Ingram (dry skin).
Parus major	...	+	+	+	..	+	..	..	..	Whitish-grey.	Somewhat scanty ; tracts much abbreviated.	Ingram.
P. cæruleus	...	+	+	+	..	...	...	..	...	Whitish.	Not very profuse.	Ingram.
P. ater *	...	+	+	+	..	+	..	...	..	Pale smoky-grey.	Not very profuse.	Ingram.
P. palustris	...	+	+	+	..	+	...	...	...	Greyish-white.	Somewhat scanty.	Ingram.
Regulus r. anglorum	...	+	+	..	.	..	..	...	.	Dark grey.	Short and scanty.	Ticehurst.
Lanius collurio †	...	...	..	..	..	.	.	...	+	....	....	Ingram.
Muscicapa hypoleuca	...	+	+	+	..	+	...	...	..	Dark grey.	Scanty ; moderate length.	Ticehurst.
M. striata (grisola)	...	+	+	+	.	+	+	...	.	Smoky-grey.	Moderate length.	Ingram.
Phylloscopus trochilus	...	+	+	+	...		...	...	..	Pale greyish.	Not very plentiful.	Ingram.
Ph. sibilatrix	...	+	+	+	...	...	...	...	..	Greyish-white.	Fairly long and scanty.	Ingram.
Turdus viscivorus ‡	+	+	+	+	+	+	...	...	..	Buffish-white.	Profuse.	Ingram.
T. philomelus (musicus)	...	+	+	+	+	+	...	...	...	Pale sandy-buff.	Fairly long, but not very dense.	Ingram.
T. merula §	...	+	+	+	+	+	...	...	..	Smoky-drab.	Not very dense.	Ingram.
T. torquatus	...	+	+	+	+	+	..	...	..	Pale buffish-grey.	Moderately long.	Ticehurst.
T. musicus (iliacus)	..	+	+	+	+	+	..	...	...	Pale buffish-white.	Moderate length.	Ingram.
Œnanthe œnanthe	...	+	+	+	...	+	+	...	...	Dark grey.	Moderate length.	Ticehurst.
Saxicola rubetra	...	+	+	+	..	+	...	...	..	Grey.	....	Leigh.
S. torquata	...	+	+	+	...	+	...	...	...	Dark grey.	Moderate length.	Ticehurst.
Phœnicurus ochrurus gibraltariensis. ‖	...	+	+	?	..	+	...	...	...	Brownish-grey.	Fairly long.	Ingram (dry skin).
Phœnicurus phœnicurus	+	+	+	+	...	+	...	...	...	Dark grey.	Long.	Ticehurst.

Luscinia megarhyncha (*Daulias luscinia*).		+	+	+		+				Greyish-black.	Long and plentiful on head.	Ingram.
Erithacus rubecula		+	+	+		+				Smoky-grey.	Long, loose, and spreading.	Ingram.
Prunella modularis		+	+	+	+	+	+	..		Sooty-black.	Fairly long and loose in texture.	Ingram.
Troglodytes troglodytes		+	+			+				Dusky soot-grey.	Fairly long and loose in texture.	Ingram.
Cinclus cinclus		+	+	+		+				Smoky-grey.	Very long and plentiful.	Ticehurst.
Hirundo rustica		+	+	+		+	+			Pale grey.	Soft and loose in texture; not very plentiful.	Ingram.
Chelidon urbica		+	+	+		+	+			White.	Rather scanty.	Ticehurst.
Riparia riparia		+	+	+		+				Greyish-white.	Humeral and spinal tracts abbreviated.	Ingram.
Caprimulgus europæus	(More or less generally distributed.)									A mixture of sooty-grey and drab.	Loose in texture.	Ingram.
Upupa epops	?	+	+	?	?	+	?	?	?	Greyish-drab.	Long and loose in texture.	Ingram (dry skin).

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* Sometimes absent from humeral and spinal tracts.

† This Shrike, and probably all the Laniidæ, develops white or whitish plumules at an early age. These appear with the teleoptiles when the fledgelings are about four days old. They occur on the wings (between the sprouting contour-feathers), near the scapulars, and along the apteria on either side of the spinal tract, but more especially on the sides of the posterior portion of the body. Similar white down has been noticed in the Woodchat and Lesser Grey Shrike. In four-day-old specimens of *Lanius collurio* pre-pennæ have been noticed on the ventral tract. Although likely, it is not certain whether these are present when the nestlings are first hatched.

‡ Supraorbital tract sometimes absent.

§ Usually on greater coverts only.

Greys are very liable to become brownish with exposure or with age; consequently these colours are always open to doubt when taken from a dried specimen.

Neossoptiles are wanting in the following species, and these are consequently naked when hatched:—

Pica pica, *Garrulus glandarius*, *Passer domesticus*, *P. montanus*, *Panurus biarmicus*, *Lanius senator* (only dried specimen examined), *Acrocephalus arundinaceus*, *A. scirpaceus*, *A. palustris*, *A. schœnobænus*, *Hypolais polyglotta*, *Sylvia borin*, *S. atricapilla*, *S. communis*, *S. curruca*, *Micropus apus*, *Coracias garrulus*, *Alcedo ispida*, *Picus viridis*, *Dryobates major*, *Iynx torquilla*, *Cuculus canorus*.

the more important feathers have filamentous prolongations, and these often form a sort of fringe to the rounded end of the feathers. In the Goshawk these barb-extensions are delicate and tapering, but they are sometimes quite blunt as in *Aquila nævia.* Where these filamentous prolongations occur (*i. e.* on the secondaries in young Goshawks) the pre-pennæ down-tufts are carried on the extremities of the central ones, opposite the end of the shaft. From this fact it seems probable that these barb-prolongations form the degenerate remains of a once distinct mesoptile plumage, a generation of plumage which may be still found in a fairly complete form in the Tawny Owl. It should be noted that where the barb-prolongations are wanting, as always appears to be the case with the lesser contour-feathers on the crown, back, etc., the pre-pennæ down-tufts are sessile (fig. 17, p. 875).

A close examination of the neossoptiles in different genera reveals considerable structural variation in these feathers. In the present paper I have only hinted at a few of these differences, but I hope at some future date to make use of the data and material in my possession, and also to elaborate my notes on certain nidifugous species.

[Note.—The figures are all larger than natural size. Unfortunately, owing to the fact that they were drawn direct from life at different times, the scale to which they have been enlarged varies in almost every case.]

XXXIII.—*Notes on the Birds of North-East Chihli, in North China.* Part II.* By J. D. D. La Touche, C.M.Z.S., M.B.O.U.

73. **Merula hortulorum** (P. Scl.).

Turdus hortulorum and *Turdus pelios* D. & O. p. 151.

Merula hortulorum La T. p. 571.

The Grey-backed Ouzel is of irregular occurrence at Chinwangtao. In 1911, I saw three on the 29th of April and 1st of May, but did not meet with any others until 1914, when I saw three or four at the port on the 2nd of May, one of which I shot. On the 6th of May following I secured another. My collector brought me one taken by him that spring at Shanhaikuan on the 24th of April. On the 30th of April, 1915, I saw an adult male running about on the bluff.

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* For Part I., *vide* supra, pp. 629–671.

Turdus hortulorum Sclater of David & Oustalet's 'Oiseaux de la Chine' is the immature male, while *Turdus pelios* of the same authors is the adult male, which has no spots on the throat and breast. I do not know of any evidence establishing this bird as a resident in south-east China. It is a fairly common migratory Thrush in eastern China, and it winters in Fohkien and Kwangtung.

74. **Merula naumanni** (Temm.).

Turdus naumanni D. & O. p. 153.

Merula naumanni La T. p. 571.

The Red-tailed Ouzel is an abundant migrant in the district from the end of March to the middle of April. It reappears rather late in October and may be met with throughout November. It winters in sheltered places in the mountains.

This Thrush was common in the mountains of the Liautung Peninsula in February 1890.

75. **Merula fuscata** (Pallas).

Turdus fuscatus D. & O. p. 155.

Merula fuscata La T. p. 572.

The Dusky Ouzel is common in this district during April and May and passes again during October. In 1913 one was seen on the 8th of March, and in 1915 one appeared at the port on the 14th of February and remained until the 19th.

I saw this Thrush at Newchwang in May 1889.

76. **Merula ruficollis** (Pallas).

Turdus ruficollis D. & O. p. 156.

I observed the Red-necked Ouzel for the first time on the 8th of March, 1917, when I shot one of three specimens. I subsequently saw thrushes on the 15th and 24th of that month, which I took to be of this species. I have a specimen from Chien An.

Soft parts of the example obtained: Iris dark brown; mouth, gape, and base of lower mandible yellow, rest of bill blackish brown; legs livid greyish green, back of tarsi yellowish. Wing 5·1 in.; total length 9·9 in.

77. **Oreocincla varia** (Pallas).

Oreocincla varia D. & O. p. 158.

White's Thrush passes north-east Chihli in September and October, but appears to be scarce. I have yearly records as follows:—15/9/12, 14/9/13, 23/9/14, Chinwangtao and close vicinity, 24/8/14 (remains of a bird found at Chinwangtao), Oct. 1914, Shanhaikuan, 18/9/15, Chinwangtao; six birds in all. The bird seen at Chinwangtao on 23 September, 1914, made when flying a peculiar loud flapping sound resembling that made by pigeons and doves when taking flight.

78. **Geocichla sibirica** (Pallas).

Turdus sibiricus D. & O. p. 149.

Geocichla sibirica La T. p. 572.

The Siberian Ground-Thrush passes in spring. I shot a male in its second year at Chinwangtao on the 23rd of May, 1912, and two were shot or seen a few miles inland on the 23rd and 25th of May, 1913. I have a nearly adult male shot at Shanhaikuan in late spring.

I shot a pair of this Thrush on the plain near Newchwang on the 26th of May, 1889.

79. **Petrophila solitaria manilla** (Bodd.).

Monticola solitaria D. & O. p. 161.

Petrophila manilla La T. p. 572.

The Red-bellied Rock-Thrush first arrives at Chinwangtao during the first week in May, and migrants may be seen until about the middle of the month. It breeds on high rocks in the mountains. I have not noticed the autumn movements.

Four adult males in normal breeding dress and an adult male with blue flanks and the centre of the under parts mixed blue and red, vary in length of wing from 4·60 to 4·69 in., culmen 0·72 to 0·88 in. The second primary in all but one is just under the 5th (in the exception, it is exactly between the 5th and 6th). A female measures: wing 4·47 in., culmen 0·70 in. This series confirms my supposition (Ibis, 1913, p. 270) that the small race of this Rock-Thrush breeds in northern China, none of the eight or nine birds collected approaching in size the large birds taken at Shaweishan, which were most probably bound for Japan.

Two nestlings were brought to me on the 25th of June and another somewhat younger on the 2nd of July, 1917. These birds, which were already very tame when they arrived, became extremely familiar and charming pets. I fed them chiefly on green-bean paste mixed with hard-boiled egg yolk and gave them also bread and milk and chopped raw beef, and grasshoppers when these were in season. They fed eagerly and were very voracious. When they could feed by themselves, they continued to take food from my hand, and often indulged in a tug-of-war among themselves, two of them getting hold of a piece of meat or a grasshopper and pulling until one of them remained in sole possession of the morsel. After a time, I placed them in a large cage with some of my other birds. They were inclined to bully these, and one day I found one pulling about my *Rhopophilus pekinensis*, which it would probably have killed if I had not interfered. I think one of these little thrushes was responsible for the death of a sickly bird which was in the same cage. One day, one of them, while at liberty in the room, caught hold of a small mouse I had in a box and killed it. When I took these birds down to Shanghai in the following October none of them showed any sign of putting on the adult plumage. A wild-caught adult never became tame, but soon learnt to eat dried "waterboatmen" and raw beef. Although I had this bird at liberty in my room it never attempted to sing, and I released it after a month or two.

An incomplete clutch of two fresh eggs was brought to me on the 29th of May, 1917, a full clutch of five eggs, slightly incubated, on the 5th of June, one hatching egg on the 15th of June, two fresh eggs on the 25th of June, and one clutch of four incubated and very stale eggs on the 15th of July following These eggs are of very pale blue, a few having fine specks of pale red. The texture of the shell is smooth and glossy. The shape varies from nearly oval to ovate. Thirteen eggs average 0·99 × 0·75 in. The largest is 1·01 × 0·77 in. and the smallest 0·96 × 0·74 in.

The nest pads brought with the eggs were composed of fine rootlets over a foundation of moss.

Monticola saxatilis, stated by Père David to occur in summer in the mountains of Chihli, has not so far been procured by me near Chinwangtao.

80. **Petrophila gularis** (Swinhoe).

Monticola gularis D. & O. p. 161, pl. 42.

Petrophila gularis La T. p. 572.

The White-throated Rock-Thrush passes towards the end of May. I saw a few at the port itself on the 23rd of May, 1914. It probably summers in this part of Chihli as well as further west.

This bird also passes Newchwang in May.

81. **Tharrhaleus montanellus** (Pallas).

Accentor montanellus D. & O. p. 180, pl. 33.

The Chinese Hedge-Sparrow is a common winter visitant to north-east Chihli. It is found on migration at Chinwangtao in very early spring and in November. During the winter 1914–15, this bird was often seen at the port, and from the 7th to the 23rd of March one or two haunted brushwood and other cover by the roadside. On the 23rd of March I saw as many as five of these birds in a garden. This Hedge-Sparrow appears to have much the same habits as the British bird. It is a familiar little bird, fond of underwood and dead brushwood, through which it flits or creeps. I have never heard it utter a sound.

The Chinese Hedge-Sparrow was common in February 1890 in the mountains of the Liautung Peninsula. It was common that spring at Newchwang on migration.

82. **Accentor collaris erythropygius** Swinhoe.

Accentor erythropygius D. & O. p. 178.

The Chinese Alpine Accentor is apparently a common bird in the mountains. I have a number of examples shot in winter near Shanhaikuan and one shot by Mr. A. Hall in outer Chihli. The range of this bird extends to Manchuria and eastern Siberia.

83. **Coccothraustes coccothraustes japonicus** T. & S.

Coccothraustes vulgaris D. & O. p. 348.

Coccothraustes japonicus La T. p. 572.

The Japanese Hawfinch is a common resident in north-east Chihli.

84. **Eophona melanura migratoria** Hartert.

Eophona melanura D. & O. p. 347 (part), pl. 92.

The Lesser or Migratory Black-tailed Hawfinch is apparently common in the Chien An district whence I have several specimens. I have also a male from Shanhaikuan shot on 19 May, 1914.

85. **Eophona personata magnirostris** Hartert.

Eophona personata D. & O. p. 346 (part), pl. 91.

The Large-billed Masked Hawfinch is a somewhat uncommon migrant in north-east Chihli. A handsome adult male was captured on the 17th of May while clinging to one of our house chimneys and was brought down in a dying condition. It was quite uninjured and in good condition and fat, and its stomach was crammed with broken seeds and small beans. Its plumage was fresh, and there was no sign of its having escaped from captivity. I have also a specimen from outer Chihli and one from Shanhaikuan shot on 12 November, 1914.

A tame bird seen on 12 June, 1915, in the possession of a native, would fly up and catch one after another two beads thrown up by its owner and bring them both back to him. The performance was repeated several times before me. On its return to the man's arm the bird was given a few seeds in exchange for the beads. The agility of this bird was considerable. It had been two months in captivity according to the owner's statement.

I saw these birds at Newchwang in 1889, where the natives teach them to perform the same tricks of fetching and carrying.

86. **Loxia curvirostra albiventris** Swinhoe.

Loxia albiventris D. & O. p. 360.

The Eastern Crossbill is apparently of irregular appearance in north-east Chihli. Three netted specimens were procured at Shanhaikuan on the 29th of October, 1911. It was reported to me as common in the autumn of 1915, and a series of twenty birds, taken near Shanhaikuan in November 1917 and a pair, dated 25 December, 1917, were sent to me.

I shot this bird in the Liautung Peninsula in February 1890.

87. **Propasser roseus** Pallas.

Propasser roseus D. &. O. p. 352 ; La T. p. 572.

Pallas's Rose-Finch is occasionally seen at the port on migration. I saw a few on the 4th March, 1911, on the 15th and 19th October, 1911, and on the 15th and 30th October and 20th November, 1913, and 9th October, 1915. I have a specimen from Chien An. It is a winter visitant to north-east Chihli, but I have not seen any at that season near Chinwangtao. I found this Rose-Finch to be quite common in February 1890 in the mountains of the Liautung Peninsula.

88. **Carpodacus erythrinus** (Pallas).

Carpodacus erythrinus D. & O. p. 350 ; La T. p. 572.

The Common Rose-Finch passes north-east Chihli at the end of April and during May. It is abundant during the latter half of May.

89. **Acanthis linaria** (L.).

Acanthis linaria D. & O. p. 336.

The Mealy Redpoll is a common migrant in the district in October and November. It winters in north-east Chihli, and I have seen it at the port at that season.

90. Chloris sinica (L.).

Chlorospiza sinica D. & O. p. 338.

The Chinese Greenfinch or Golden-wing is a common resident in north-east Chihli. Birds from Chien An and Chingwangtao do not appear to differ from specimens from the Lower Yangtse. I procured three nests in 1915. One taken on the 29th of April was brought to me with one egg (the others were probably broken), and two taken on the 9th of May following each contained four eggs. These eggs are of the pale bluish-green variety with specks of black and dark brown, with a few fine hair-lines on two of the eggs. The single egg and those of one of the clutches taken on the 9th of May have few or no underlying markings, but two of the eggs of the third clutch have numerous very pale underlying shell-blotches and spots of reddish grey on the large end. Six of the eggs are ovate in shape and three are a blunt oval-ovate. The single egg measures 0·65 × 0·47 in.; the others vary in length from 0·67 to 0·75 in. and in breadth from 0·50 to 0·54 in. The nests are the usual compact little cups with thick sides, and are made of pine needles, fine rootlets, and the top twigs of a woolly-leaved plant, with a liberal admixture of wool, feathers (quail and others), goat or other hair, and spiders' egg-cases. One is lined with a little horsehair, the others with feathers, wool, and fine rootlets intermixed. The inner diameter is 2·00 in., the inner depth from $1\frac{1}{4}$ to $1\frac{3}{4}$ in., the outer diameter $3\frac{1}{2}$ to $4\frac{1}{2}$ in., and the outer depth from 2 to $2\frac{1}{2}$ in. These nests were placed on pine trees. Two nests, each containing four fresh eggs resembling the above, were brought to me from the mountains, north of the port, on the 15th of June and 2nd of July, 1917.

91. Chrysomitris spinus (L.).

Chrysomitris spinus D. & O. p. 337.

The Siskin passes through the district in spring but must be uncommon, as I have only one example, taken near Shanhaikuan on the 30th of April, 1914, and I have no local records. I have no note of its occurrence in autumn.

92. **Fringilla montifringilla** (L.).

Fringilla montifringilla D. & O. p. 333; La T. p. 572.

The Brambling is an abundant spring migrant. It appears at the port from the end of March to about the 24th of April. The males are at that season generally in full or nearly full summer dress with the buff edges of the feathers worn off. It occurs in autumn during October and November, and winters in the hills.

The Brambling passes Newchwang in April. I also obtained a single female in February 1890 in the mountains of the Liautung Peninsula.

93. **Passer montanus** (L.).

Passer montanus D. & O. p. 340.

The Tree-Sparrow is abundant, as elsewhere in China, in the cultivated districts of north-east Chihli. At the port it occurs all the year round even in the depth of winter. In autumn large flocks are to be seen in the crops, on which they no doubt levy heavy toll; but the immense quantities of insects consumed by the birds in summer without doubt largely make up for damage to the grain crops. Probably a certain movement goes on at migration seasons, as is proved by the observations made at Shaweishan.

94. **Calcarius lapponicus coloratus** Ridgw.

Plectrophanes lapponicus D. & O. p. 320.

Calcarius lapponicus La T. p. 572.

The Lapland Bunting occurs on the plain in late winter and early spring in immense flocks. It reappears in numbers in late autumn and without doubt winters here.

This Bunting was common in the mountains of the Liautung Peninsula in February 1890.

95. **Plectrophenax nivalis** (L.).

Plectrophanes nivalis D. & O. p. 320.

Plectrophenax nivalis La T. p. 572.

The Snow-Bunting is a rare bird in northern China according to Père David. I have only one specimen, which I shot on the seashore at Chinwangtao on the 17th of February, 1913. From its appearance this bird had been for some time at the port.

96. **Emberiza pallasii** (Cab.).

Schœnicola pallasii D. & O. p. 321.

Emberiza passerina La T. p. 572.

Pallas's Reed-Bunting is a very abundant migrant in north-east Chihli and apparently winters at Chinwangtao. It occurs on migration in the vicinity from the beginning of March to the beginning of May, and I have seen large numbers in October at the marshes near by. The birds at that season are in very handsome orange-buff plumage. I have a male in full breeding dress shot at Shanhaikuan on 8 May, 1915.

This Reed-Bunting was common in southern Manchuria in February and March, 1890, and probably also winters there.

97. **Emberiza yessoensis continentalis** Witherby.

Emberiza continentalis La T. p. 573.

The Chinese Reed-Bunting is a common migrant at Chinwangtao in spring, the 9th of March and the 19th of May being the earliest and latest records there. A few are met with in autumn from the beginning of October. My latest record at that season is the 17th of November.

A female example obtained at Shanhaikuan in late spring has the head coloured as follows: Crown brownish black, sides of the head pure black; an ill-defined white eyebrow; chin, upper throat, and malar stripe black, the chin and upper throat with white fringes to the feathers; sides of neck white, the white prolonged brokenly towards the base of the lower mandible; the under parts are very white. Wing 2·35 in.

98. **Emberiza schœniclus pyrrhulina** Swinhoe.

Emberiza pyrrhulina La T. p. 573.

The Finch-billed Reed-Bunting is not uncommon at Chinwangtao and in the vicinity at the end of March and during April. I have no note of its occurrence in autumn.

I found this Reed-Bunting at Newchang in the reed-beds of the River Liao in the early spring of 1890.

99. **Emberiza fucata** Pallas.

Emberiza fucata D. & O. p. 325; La T. p. 573.

The Grey-headed Bunting is a common migrant in the vicinity of Chinwangtao during spring. I have obtained it at that season from the 24th of April to the 5th of June. It occurs commonly in autumn during the first half of October.

100. **Emberiza pusilla** Pallas.

Emberiza pusilla D. & O. p. 323; La T. p. 573.

The Little Bunting is extremely abundant during the spring passage. A few appear towards the first half of April, and during May they swarm all over the country until about the 20th of that month. In autumn it occurs in October and November.

101. **Emberiza spodocephala** Pallas.

Emberiza spodocephala D. & O. p. 329; La T. p. 573.

The Grey-headed Black-faced Bunting is a very common migrant. It passes from early in April until the beginning of June and it occurs commonly in September and October.

102. **Emberiza rustica** Pallas.

Emberiza rustica D. & O. p. 324; La T. p. 573.

The Rustic Bunting is an abundant migrant, both in spring from the end of February to late in March and in autumn. It winters in numbers in the district.

103. **Emberiza elegans** Temminck.

Emberiza elegans D. & O. p. 322; La T. p. 573.

The Yellow-throated Bunting is found from about the middle of March to the middle of April. It also occurs in autumn; and probably in winter in sheltered localities.

I found this Bunting in the mountains of the Liautung Peninsula in February 1890.

104. **Emberiza chrysophrys** Pallas.

Emberiza chrysophrys D. & O. p. 325; La T. p. 573.

The Yellow-browed Bunting passes commonly at the beginning of May and may be found in the vicinity till about the 20th of May. I have no note of its occurrence in autumn, but it has probably been overlooked.

105. **Emberiza tristrami** Swinhoe.

Emberiza tristrami D. & O. p. 326; La T. p. 574.

Tristram's Bunting passes from the end of April to the end of May or the beginning of June. I have a female found dead at Chinwangtao on the 23rd of October, 1915, by one of my children.

106. **Emberiza cioides** Brandt.

Emberiza cioides D. & O. p. 328.

The Eastern Meadow-Bunting is a very common resident species in this district. It is as elsewhere in China and Manchuria a hill bird, but comes down to the plains in winter. During January and February, 1915, a flock appeared here and remained throughout those two months, feeding on the seeds of grasses on the bluff. This was, no doubt, on account of the severe weather which prevailed at the time. One of these which I shot was a large bird, measuring 3·30 in. in the wing. I have no Siberian examples, but I am unable to distinguish between birds from Fohkien, the Lower Yangtse, and north-east Chihli. Birds from Chihfeng in northern (outer) Chihli, on the borders of the Gobi Desert are precisely similar to those from Shanhaikuan, and these do not differ appreciably from examples collected in south-east China. The chin-spot is a variable feature.

The wing-measurements of 35 examples of this species in my collection are as follows:—

		in.	in.		in.	in.
Fohkien ..	♂	9, 2·92–3·01,	aver. 2·98.	♀	5, 2·71–2·85,	aver. 2·76
Chinkiang ..	♂	2, 2·96–3·11	„ 3·04.	♀	4, 2·80–2·90	„ 2·86
N.E. Chihli .	♂	13, 3·01–3·30	„ 3·04.	♀	2, 2·88–2·93	„ 2·91
		24			11	

Some thirty nests with eggs of this Bunting were brought to me from the mountains north of Chinwangtao, on the 23rd of May (two incomplete clutches), on the 26th of May (complete and nearly all fresh), and on the 3rd & 15th of June, and 2nd of July. The eggs brought on the last-mentioned date were nearly fresh, but those taken in June were nearly all more or less incubated. Most of these clutches are exceedingly handsome, the ground-colour varying from a dead white to a warm orange-pink. The tracery of lines and spots is even more varied than in eggs taken further south and occasionally encircles the whole egg. None of the eggs bears any trace of the yellow blotches found on Chinkiang or Fohkien eggs.

This Bunting was very abundant in February 1890 in the mountains of the Liautung Peninsula, and is doubtless a resident species also in that locality.

107. **Emberiza godlewskii** Taczanowski.

Emberiza cia and *E. godlewskii* D. & O. pp. 327 & 546.

Godlewski's Meadow-Bunting is a resident species in the mountains of north-east Chihli. A male shot by me on the 2nd of May, 1915, was foraging among dry vegetation on a stony reach of the Shih Ho.

I procured three clutches of Meadow-Buntings' eggs which I believe to belong to this species. All came from the mountains north of Chinwangtao. One was brought to me on the 23rd of May, the second on the 29th of May, and the third, accompanied by a male bird, which the collector said was owner of the nest, on the 3rd of June, 1917. All these eggs were fresh, each clutch being composed of four eggs. The eggs differ from those of *E. cioides* in having a pale green ground-colour and fewer markings. The first clutch is of a very elongated ovate, a very unusual shape for these Buntings' eggs, the others are a broad ovate, one of the eggs being a dwarf. They measure as follows: largest egg 0·87 × 0·57 in., smallest 0·66 × 0·53 in., broadest 0·79 × 0·61 in., average 0·80 × 0·59 in.

108. **Emberiza leucocephala** Gm.

Emberiza leucocephala D. & O. p. 329.

The Pine Bunting is extremely common in winter in the vicinity of Chinwangtao, and is found on the plains near the hills as well as in the mountains. Two males shot near Shanhaikuan in February have the throat pure chestnut without pale fringes and the crown very pure white.

109. Emberiza aureola Pallas.

Euspiza aureola D. & O. p. 332.

Emberiza aureola La T. p. 574.

The Yellow-breasted Bunting is very abundant during both passages. It occurs in spring from the end of April to the end of May or beginning of June. Two were seen at the port on the 13th of June. This bird reappears very early on the return passage, and I have seen one (an adult male) on the 30th of July. It is extremely abundant from the beginning of August and in September, when it swarms in the crops. A few occur at the beginning of October, as I saw two at the port on the 7th and 9th of that month in 1915.

This Bunting was abundant at Newchwang in May 1889. It has a very sweet song and stands captivity well.

110. Emberiza rutila Pallas.

Euspiza rutila D. & O. p. 331.

Emberiza rutila La T. p. 574.

The Ruddy Bunting passes in May, but I have hardly any notes of its occurrence. Two live birds in first plumage, obtained on the 24th of September, moulted during October into the immature male plumage. This Bunting is also a fine songster.

This bird occurs at Newchwang on migration. It would appear to nest at Chihfeng in northern Chihli, as Mr. A. L. Hall procured there a nest containing five eggs, which he assured me belonged to a live cock-bird he very kindly brought me from that locality. Four of the eggs were unfortunately broken. The remaining one is whitish, scrolled round the large end with brown hair-lines and underlying violet lines, the latter prolonged on the middle part of the egg. There is a brown spot near the apex. The shape is a rather blunt ovate. It measures 0·80 by about 0·60 in.

111. Chelidon urbica whitelyi Swinhoe.

Chelidon lagopoda D. & O. p. 130; La T. p. 574.

I shot the only specimen of Pallas's House-Martin seen by me at Chinwangtao on the 18th of May, 1913, as it was flying along the seashore in company with House-Swallows. Père David found this Martin breeding in the mountains to the west of Peking. I have another example shot at Shaweishan on the 10th of May, 1908. The Rev. Geo. D. Wilder, of Peking, has informed me that he saw a few pairs breeding on rocks in the mountains to the north-west of Chinwangtao.

112. **Cotile riparia** (L.).
Cotyle riparia D. & O. p. 128.
Cotile riparia La T. p. 574.

The Sand-Martin passes in great numbers from about the 10th of August to early mid-October. The birds travel in company with House-Swallows, Swifts and other birds, the bulk of the migrants passing during the latter half of August and in early September. The spring migration is not often apparent and in most years not many birds are seen. On the 17th and 19th of May, 1913, great numbers passed the port. Without doubt, this bird breeds in the vicinity.

113. **Ptyonoprogne rupestris** (Scop.).
Ptyonoprogne rupestris D. & O. p. 129.

The Crag Martin breeds regularly in the Shanhaikuan mountains. In 1915, my collector informed me that the birds first appeared on the 6th of April. I saw one that year, on the 2nd of May, circling high over a rock where the birds are said to breed every year.

114. **Hirundo rustica gutturalis** Scop.
Hirundo gutturalis D. & O. p. 124; La T. p. 574.

The earliest record I have of the appearance of the Eastern House-Swallow at Chinwangtao is the 10th of April (1913). The spring passage lasts from about that date until the last days in May. This Swallow passes again from about the first week in August, and birds are to be seen migrating until about the middle of October. I saw a belated bird on the 17th of November, 1912. The local summer birds arrive later than the migrants. They begin to build about the end of April. They leave towards the end of August, but in

1914 there were nests with unfledged young at the railway station on the 30th of August. These were no doubt a second brood. The majority of the local birds were congregating on the telegraph-wires and preparing to leave on the 27th of August that year. In the spring of 1915 the scarcity of Swallows here was remarkable. I hardly noticed any migration and the local birds appeared very late. None bred at the Custom House, where in previous years there had been numerous nests. At the railway-station, four miles inland, on the 18th of May one nest was about three-quarters built and the others were only just begun. In 1911 they were already building on the 23rd of April.

115. **Hirundo rustica erythrogastra** Bodd.

Hirundo gutturalis D. & O. p. 124 (part).

Hirundo erythrogastra La T. p. 574.

The American Swallow was not at all uncommon in the spring of 1913, and was observed from the middle of April to the 20th of May. I saw one at the port on the 13th of July which was evidently breeding. This Swallow probably passes regularly, and the want of records is due to no special observations having been made.

While at Peking in 1883, I remember seeing large flocks of red-bellied Swallows which were probably this bird or *H. tytleri*. There is a specimen of this latter Swallow collected at Peking in the Shanghai Museum, and Mr. Styan some years ago recorded in the Proceedings of the Zoological Society of London the capture of rufous-bellied Swallows which he identified as *H. savignii*.

116. **Hirundo daurica nipalensis** Hodgson.

Cecropis daurica D. & O. p. 125.

Hirundo nipalensis La T. p. 574.

Hodgson's Striated Swallow passes in great numbers with the House-Swallow. In 1913 it was observed migrating from the 14th of April until the 20th of May, and these are probably the average dates for the spring passage. The return passage begins in the first week in August and lasts until about the first week in October, but the majority of the birds have passed by the 21st of September. The local birds begin to build about the beginning of May. There is occasionally a second brood. The birds take their departure with the common House-Swallows.

117. **Ampelis garrulus** (L.).

Ampelis garrulus D. & O. p. 130.

The Bohemian Waxwing is of irregular occurrence. I saw a newly-caught bird in the possession of a native at Shanhaikuan on the 23rd of April, 1911. On the 21st of November, 1915, there were a few for sale in the market, and again on the 21st of February, 1916; all were females. On the 12th of March, 1916, a single bird appeared at the port and remained there until the 21st of the month, when it was shot by my over-zealous collector. I had a live example, procured that spring, which I kept until my departure from Chinwangtao, when I gave it to a friend at Shanghai together with most of my other live birds.

118. **Motacilla leucopsis** Gould.

Motacilla alboides D. & O. p. 298.

Motacilla leucopsis La T. p. 575.

The White-faced Wagtail is not often seen near Chinwangtao, but it is common inland among the mountains, where it nests. A nest and three eggs were brought to me from the mountains north of the port on the 11th of May, 1917.

119. **Motacilla ocularis** Swinhoe.

Motacilla ocularis D. & O. p. 299; La T. p. 575.

The Streak-eyed Wagtail is common on passage from about the 25th of April to the middle of May. The birds are then in full or nearly complete summer plumage. In autumn it passes with the last of the Yellow Wagtails from about the middle of September to the middle of October. I have examples from Chien An dated 7 April.

120. **Motacilla boarula melanope** Pallas.

Calobates melanope D. & O. p. 302.

Motacilla melanope La T. p. 575.

I have never seen the Eastern Grey Wagtail at the port.

I saw one or two at the foot of the mountains, twelve miles north of the port, on the 21st of May, 1911, and one was shot at Shanhaikuan by my collector on the 26th of April, 1914. I have a number of specimens from Chien An, so that it is evidently common inland.

121. **Motacilla flava simillima** Hartert.
Budytes flavus D. & O. p. 302.

122. **Motacilla flava borealis** L.
Budytes cinereicapillus D. & O. p. 303.

The Eastern Grey-headed Wagtail (*M. borealis*) and the Blue-headed Wagtail (*M. simillima*) migrate together and both forms are found in the same flocks. *M. simillima* is by far the least common and, judging from the series shot and the birds observed at sufficiently close quarters in the field, less than 20 per cent. and probably not much more than 10 per cent. of the birds composing the large flocks which pass in spring and autumn are *M. simillima*. The birds in spring are all in summer dress. On the return passage a very few still wear the bright summer plumage. These birds pass in spring from about the middle of April to about the 20th of May, and in autumn immense flocks pass from the latter half of August until the last decade of September. I have many examples of *M. borealis* from Chien An, dated from 16 April to 13 May, and two of *M. simillima* from the same locality dated 22 and 26 April.

123. **Dendronanthus indicus** (Gm.).
Limonidromus indicus D. & O. p. 305 ; La T. p. 575.

The Forest Wagtail passes through the district in May. A few were seen near the port or at Chinwangtao itself on 21 May, 1911, 12 and 20 May, 1913, and 20 May, 1916. It breeds in the mountains north of Chinwangtao, whence I have two nests, each with four eggs, brought to me on 2 July, 1917, together with the female parent bird of one of the nests. The nests, according to the native collectors, were placed on horizontal branches of pear trees. They are small neat cups, made of very fine grass stems, strips of soft grass, a few dried leaves, moss, a feather or two, and in one case, wool, all thickly bound with cobwebs, the rim of the nests finely smoothed off with cobwebs. The lining is of black and white horse- and cow-hair and very fine rootlets. One nest measured $1\frac{3}{8}$ in. in depth and $2\frac{1}{4}$ in. in diameter (inner measurements) and $1\frac{3}{4}$ in. in depth and $2\frac{1}{2}$ in. in diameter (outer measurements). The other nest is $1\frac{1}{2} \times 2\frac{1}{4}$ in. inside, and $2 \times 3\frac{1}{8}$ in. outside. The eggs are pale greyish olive-green, sparsely marked with bold spots and blotches of rich, dark (almost Vandyke) brown, over both deep and faint specks, spots and short lines of violet-grey. The surface spots often run into the ground-colour and are round in shape or else terminate in a short thick line. One egg in each clutch is much washed with reddish. An egg sent to me from Peking by the Rev. Geo. D. Wilder is quite similar to these eggs. The eggs are ovate in shape. The largest of seven of these measures 0·85 × 0·61 in. and the smallest 0·77 × 0·58 in. They average 0·80 × 0·60 in.

124. **Anthus trivialis maculatus** (Hodgson).

Pipastes agilis D. & O. p. 308.

Anthus maculatus La T. p. 575.

The Eastern Tree-Pipit passes abundantly from the last days of April to the middle of May. It passes again from the first week in September to the first week in October. I saw a belated individual in a garden at the port on the 14th of November, 1914.

125. **Anthus spinoletta japonicus** T. & S.

Anthus spinoletta D. & O. p. 306 (part).

Anthus japonicus La T. p. 575.

The Japanese Water-Pipit appears at Chinwangtao towards the middle of April and is found until about the 10th of May. It migrates in autumn in company with the Wagtails and Swallows, many flocks of which fly by in late August and September. I have seen it in the marshes in October until the 25th of that month. The first arrivals in spring are still in winter dress but soon assume the summer plumage, dark ashy-grey, upper parts obscurely spotted, and buffish vinous under parts with a few drop-like spots on the breast and flanks. I have an example from Chien An dated 11 May.

126. **Anthus spinoletta blakistoni** Swinhoe.

Anthus spinoletta D. & O. p. 306 (part).

Blakiston's Water-Pipit is found in the vicinity of Chinwangtao in October and November. It probably winters near unfrozen streams.

127. **Anthus cervinus** (Pallas).

Anthus cervinus D. & O. p. 306; La T. p. 575.

The Red-throated Pipit is of irregular occurrence in spring. I have noted it only during 1911 and 1912 on the 14th and 15th of May. It passes in September. During that month enormous flocks of Pipits pass by, and there is little doubt that the flocks are composed of all the species of East Asian Pipits.

128. **Anthus gustavi** Swinhoe.

Corydalla gustavi D. & O. p. 309.

Anthus gustavi La T. p. 575.

The Petchora Pipit passes in May. Examples were obtained or seen by the collectors on the 20th and 25th of that month in 1913. This Pipit differs from all the Chinese Pipits in having the outer rectrices nearly always of a dull orange buff. Out of a large series examined, I have seen only one with white outer rectrices.

129. **Anthus richardi** Vieill.

Corydalla richardi D. & O. p. 309.

Anthus richardi La T. p. 575.

Richard's Pipit passes commonly from about the 5th to the middle of May. It appears again early in August, and is exceedingly abundant throughout September on the plain. Large flocks of this bird may also be seen passing during that month. Young birds in first plumage are common in August and moult into the adult autumn dress at the end of that month. The young bird in first plumage is very dark brown, almost black, on the crown and upper parts, the feathers being squamate and broadly edged on the nape, hind neck, lesser wing-coverts and narrowly on the back with pale buff. The spots on the breast are dark and numerous.

I found on the beach at Chinwangtao at the end of August 1916 a skeleton of this bird with just the rectrices and wing-quills adhering.

The Rev. Geo. D. Wilder has procured at Peking and in Mongolia examples of *A. striolatus* Blyth. It is possible that this bird, hitherto unknown in China, may straggle to the coast.

130. **Otocorys alpestris flava** (Gm.).

Otocorys alpestris D. & O. p. 315.

A series of six examples of the Horned Lark shot near Shanhaikuan was brought to me on the 2nd of December, 1913: two adult males, wing 4·65 and 4·75 in.; three young males, wing 4·08, 4·15, and 4·20 in.; and an adult female, wing 4·25 in. Another was brought to me on the 9th of December following, and one was shot in the same locality on the 24th of November, 1914.

131. **Otocorys alpestris brandti** Dresser.

Otocorys sibirica D. & O. p. 315.

Two very handsome male examples of the Siberian Horned Lark were collected near Shanhaikuan at the beginning of November 1912. I have another from Chihfeng in northern Chihli, where the bird apparently winters. The latter example is darker and browner grey above than in the Shanhaikuan specimens; it is also somewhat larger. The wings in the three examples measure 4·20, 4·25, and 4·30 in. respectively.

132. **Melanocorypha mongolica** (Pallas).

Melanocorypha mongolica D. & O. p. 319, pl.

The Mongolian Calandra Lark is not usually of common occurrence in this vicinity. On the 14th and 15th of November, 1914, however, myriads of these birds flew over, from an easterly or east-north-easterly direction going west. Flocks upon flocks composed of hundreds of these handsome birds went by during these two days. On the 16th I saw a large flock a few miles inland also going west, and I was told that the birds had been passing for four days. Many were netted by the natives and live birds were selling in the market for a few cents. Flying with the Mongolian Larks were large flocks of *Alaudula cheleensis.* All these birds passed by or settled in the fields for a short time and then flew on.

133. Alauda arvensis pekinensis Swinhoe.

Alauda pekinensis Swinhoe, P. Z. S. 1863, p. 83.

Alauda arvensis D. & O. p. 312.

Great numbers of Larks fly past during October and November, often in company with the flocks of rooks and jackdaws. Many remain on the plain during the winter and migration begins again early in March, migrants being seen until about the middle of April.

The Larks obtained in this locality during winter have the ground-colour of the feathers of the upper parts of a rather light sandy buff, the breast is pale-coloured, with narrow, well-defined spots. Five males obtained, one on the 7th of November and four in February, measure in the wing from 4·28 to 4·48 in., three females obtained in January and on 8th and 22nd of March are similar (wing 4·00 to 4·20). A female shot at Shaweishan on the 4th of November (wing 4·20) resembles these north-east Chihli winter birds. Four males shot here in September and October on migration have similar upper parts, but the breast is tawny with rather large and less well-defined spots, wing 4·40 to 4·60 in. The same bird occurs at Chinkiang in winter (wing, ♂ 4·37 in., ♀ 4·10 in.), and some winter birds from Foochow are very similar as to colouring, but are smaller (wing, ♂ 4·01 to 4·22 in., ♀ 3·90 in.).

134. Alauda arvensis cinerascens Ehmcke.

Alauda arvensis D. & O. p. 312 (part); La T. p. 576.

A small, dark-coloured Lark, probably Ehmcke's Skylark, passes here in spring. I have autumn examples from Shaweishan, a winter bird from Chinkiang, and two winter birds from Foochow. These birds are very heavily marked above, the feathers of the crown, upper parts, wings, and tail are blackish brown, narrowly edged on the crown and upper parts with rather dark greyish sandy. The breast is heavily marked with large spots. Wing, ♂ 4·10 to 4·30 in., ♀ 3·85 to 4·00 in.

135. **Alaudula minor cheleensis** (Swinhoe).

Calandrella cheleensis D. & O. p. 317.

Alaudula cheleensis La T. p. 575.

The North China Sand-Lark breeds abundantly on the plain and on the stony reaches of the Shih Ho. I do not know that any winter, but flocks travel past with the Skylarks in autumn. As mentioned above, great numbers passed with the Mongolian Larks in November 1914. I found a frozen migrant on the breakwater here on the 12th of February, 1911, and that month numbers which had evidently just arrived were seen on the plain. Breeding takes place during April and May. Two nests were found by my children on the 16th of May at the marshes. Each contained three eggs, the full clutch. The nests were built in small depressions in the ground on the plain. Two others found at the port were on the sand-hills on the 6th of May, and contained respectively one and two eggs. Another nest seen by me on the 2nd of May was sunk deep in the sandy soil in the dry stony bed of the Shih Ho and contained two eggs. The nests are made of scraps of grasses and fine rootlets. They are very fragile and generally come to pieces on being removed. The eggs are three in number. The ground-colour is a yellowish or greenish white. The markings are pale yellowish or clayish brown with lilac-grey shell-specks, the latter forming a more or less broad zone round the larger end. A clutch taken on 24 April, 1915, measures 0·77 × 0·56 in. (two eggs) and 0·78 × 0·56 in. Another, kindly measured for me at the British Museum by Mr. C. B. Rickett, measures (in millimetres) 20 × 16 and 21 × 16 (two eggs).

136. **Calandrella brachydactyla** (Leisl.).

Calandrella brachydactyla D. & O. p. 318 ; La T. p. 575.

My collectors met on the 19th and 27th of April, 1913, several flocks of these Larks and shot a number of specimens. I have one example from the neighbourhood of Shanhaikuan shot on the 25th of April of the following year. I have never noticed any myself. So far as I could make out, there were none of these birds among the flocks of larks seen on the 14th and 15th of November, 1914.

137. **Galerida cristata leautungensis** Swinhoe.

Galerida cristata D. & O. p. 317.

The North China Crested Lark is a common resident in the hill-country. I have seen two examples on the coast: one at the port on the 4th of October, 1912, in stormy weather, and the other in the vicinity of the marshes on the 12th of October, 1913. The weather on the latter day was fine and warm with a light westerly breeze. Both of these birds were doubtless chance stragglers from the foot-hills. Three clutches of eggs were brought to me by my collector from Shanhaikuan. The nests are rather large cups of dried grasses and bents, lined with finer grasses, of the usual lark type. The measurements of three nests are as follows:—

June 1914.					
a.	Inner diameter	2¾×3.	Inner depth	1·40	inches.
	Outer „	5¾	Outer „	1¾	„
b.	Inner „	2¾	Inner „	1¾	„
	Outer „	5	Outer „	2¼	„
3 *May*, 1915.					
c.	Inner diameter	2¾	Inner depth	1·42	„
	Outer „	5	Outer „	2¼	„

The eggs are moderately glossy and vary in shape from broad ovate to oval-ovate. The ground-colour is yellowish white or white. One of the clutches obtained in 1914 is rather heavily, but not thickly, spotted and speckled with brown and violet-grey, the latter on the surface as well as within the shell. The markings in the clutch dated 3 May, 1915, are similar to these, but the eggs have a light cap. Those of a clutch dated 10 May, 1915, without a nest, are also similar, but more closely and finely marked; one egg has a zone and the others a rough cap. The other clutch taken in 1914 has three eggs much resembling those taken on the 3rd of May, 1915, while the fourth resembles somewhat those of the clutch taken on the 10th of May, 1915. There are four eggs in a clutch. Fifteen eggs vary in size from 0·91 × 0·67 and 0·90 × 0·69 in. to 0·82 × 0·67 in., they average 0·89 × 0·68 in.

Two nearly hard-sat clutches of four and five eggs were brought to me from the mountains on the 25th of June, 1917.

138. **Picus canus jessoensis** Stejn.

Gecinus canus D. & O. p. 51 (part).

The Pale Grey-headed Woodpecker is a very common resident in north-eastern Chihli.

The birds procured in the vicinity of Chinwangtao show considerable variation in the amount of black on the nape. Some examples have no trace of markings on the occiput and nape, whereas others have these parts as well marked as some Chinkiang (Lower Yangtse) specimens of *P. guerini*. Between these two extremes there is perfect gradation in my series from Chinwangtao. The bright green upper parts of the winter plumage become almost pure grey in summer, not by abrasion but through the fading of the green into grey. The under parts also become pale greyish. The wing-measurements of fourteen males and of six females of Grey-headed Woodpeckers in my collection are as follows:—

P. c. jessoensis, north-east Chihli	11 ♂ 5·65–5·93,	2 ♀ 5·80 in.
P. c. zimmermanni, Lower Yangtse..	2 ♂ 5·71,	3 ♀ 5·70–5·77 in.
P. c. jessoensis, Yuensan, Corea	1 ♂ 5·77,	1 ♀ 5·77 in.

The wing-measurements of eleven males of *P. c. jessoensis* from north-east Chihli are as follows:—

Head and nape unmarked	5·70, 5·72, 5·78	inches.
,, ,, ,, slightly marked ..	5·70, 5·75, 5·87, 5·93	,,
,, ,, ,, well marked	5·65, 5·75, 5·85, 5·90	,,

Three young birds, fledged, but unable to fly, were brought to me on the 2nd of July, 1917. One died that day, but I kept the others for some time, feeding them on chopped raw meat and bread and milk and letting them pick up ants for themselves. They were very tame and interesting little birds, but only one kept fairly healthy. I released this one on the 15th of July as he was impatient of captivity and flew well. Unfortunately, there was a heavy storm that night and he was killed by the rain.

The Pale Grey-headed Woodpecker is a common bird in the mountains of the Liautung Peninsula, where I obtained specimens in February, 1890.

The birds recorded by me from Chinkiang (Ibis, 1907, p. 2) as *Gecinus canus* and pale-coloured *G. guerini* are, I find after comparison with specimens in the Tring Museum, *P. c. zimmermanni* Reichenow, a form described from Shantung in 1903 (Orn. Monatsber. 1903, p. 86). This subspecies extends from Peking to the Lower Yangtse and is intermediate between *P. jessoensis* and *P. guerini.*

139. **Hypopicus hyperythrus subrufinus** Cab. & Heine.

Hypopicus poliopsis D. & O. p. 51 ; La T. p. 576.

The Brown-bellied Woodpecker is a common migrant in north-east Chihli. I have seen it both in spring and in autumn at the port itself. It passes in spring from about the 10th to the last week in May, and again from the end of August to about the middle of September or even later. Nearly all the birds obtained or seen by me during the autumn passage were young birds of the year, with the remains of the spotted nestling plumage on the head, neck, and breast. The birds captured in spring are all in adult dress with more or less light-coloured under parts. The females appear to elude observation more than the males. I have only three from north-eastern Chihli, all shot in spring. The adult male has the under parts of a deep golden buff or very light yellowish brown ; the iris is crimson, the upper mandible is green and the under mandible yellow. The adult female has the under parts and the under mandible similarly coloured. Five young males obtained here and dated 4–8 September have the under parts deep umber-brown, darkest and dullest in the youngest bird, the under parts becoming lighter in the older birds. The white spots and bars of the upper parts are rather less developed in the young bird than in the adult. The head, neck, and breast are in all more or less spotted with dull whitish buff, the spots being subterminal, between the blackish centre of the feather and the blackish terminal fringe. The iris is of a greyish lake and the bill dark green, lighter green on the lower mandible. The wing-measurements are: Ad. ♂ 5·05–5·30, ad. ♀ 5·00–5·23, imm. ♂ 4·95–5·15 inches.

The bird in the Styan collection mentioned by Mr. C. Ingram ("Birds of Manchuria," Ibis, 1909, p. 452) is probably one of the two collected by me in 1889. I saw a pair on the plain near Newchwang that year on the 26th of May and shot the male. Another adult male was given to be by a friend that same month.

I have a female example from Shanghai, purchased there on the 31st of December, 1916.

140. **Dendrocopus major japonensis** Seebohm?

A heavily spotted form of the Great Spotted Woodpecker is a fairly common resident in north-east Chihli. The wing-measurements in two males are 5·00 and 5·30 in., and in three females 5·10, 5·20, and 5·25 in. One of the males has the wing-spots very large, and the two outer pairs of rectrices are white with a couple of incomplete bars. The under parts of specimens obtained near Chinwangtao are of much the same shade of brownish white as average specimens of *D. cabanisi.*

141. **Dendrocopus major luciani** (Malh.).

Picus mandarinus D. & O. p. 47 (part).

The Chinese Great Spotted Woodpecker is a very common resident in north-east Chihli. In comparing my local series of this bird with series from Fohkien and the Lower Yangtse, I have come to the conclusion that there are three fairly distinct geographical forms of this Woodpecker in eastern China. These may be distinguished as follows:—

Fohkien birds, *D. cabanisi* (Malh.).—Wing-spots small and rounded in shape, not very conspicuous on the innermost secondaries; scapulars uniform black; side rectrices evenly barred white and black.

Wing, ♂ 5·20–5·40 in.; ♀ 5·08–5·30 in. Av. 5·23 in.

L. Yangtse birds.—Wing-spots generally large and broad; scapulars as a rule with some white spots; side rectrices with generally more white than black.

Wing, ♂ 5·15–5·21 in.; ♀ 4·95–5·12 in. Av. 5·06 in.

N.E. Chihli birds, *D. luciani* (Malh.).—Wing-spots large, forming on the inner secondaries complete or almost complete white bars; scapulars often spotted with white, the white in some birds being extensive; side rectrices with narrow and often incomplete black bars.

Wing, ♂ 5·00–5·22 in. Av. 5·14 in. ♀ 5·05–5·20 in. Av. 5·12 in.

Two male and one female examples from northern Anhwei, collected by the late Father Perrin, S.J., are somewhat intermediate between the Yangtse and northern birds. They have spotted scapulars and very broad alar spots, these forming bars across the innermost secondaries of the female example which, moreover, has the rump barred with white. The side rectrices are narrowly barred with black. For remarks on this very variable bird, see Swinhoe, P. Z. S. 1863, p. 88, and Seebohm, Ibis, 1883, pp. 23–4, and Ibis, 1891, p. 376. The remarks on the variability of this Woodpecker in 'Les Oiseaux de la Chine' are certainly not borne out by my large series. The differences are to a great extent geographical. As in the Green Woodpeckers, the birds from Fohkien differ least among themselves, and those from the Yangtse and northern China are the most variable. The birds taken at Chinwangtao often grade into *D. major japonensis*. A female from this locality has the wings irregularly marked with chestnut; another has traces of chestnut on the same parts.

142. **Iyngipicus scintilliceps** (Swinhoe).

Yungipicus scintilliceps D. & O. p. 50.

The Spark-headed Woodpecker is found in the wooded districts north of Chinwangtao, but does not appear to be common.

The Fohkien and Formosan race of this Woodpecker is quite distinct. The Yangtse and Chihli birds have rather more white on the back and the wing-spots are larger. The streaks of the under parts are much more pronounced in the southern birds. The Yangtse and Chihli birds have the abdomen practically unstreaked. The barring of the side rectrices is a variable and individual feature in both forms. The wing-measurements in my series are as follows:—

Fohkien birds (*kaleensis*)	♂ 3·95–4·11 in.	♀ 3·99–4·18 in.
Yangtse birds (*scintilliceps*)	♂ 3·80–4·01 in.	♀ 3·98–4·15 in.
Chinwangtao birds (*scintilliceps*) .	♂ 4·01–4·15 in.	♀ 4·15–4·01 in.

The Spark-headed Woodpecker was common in February 1890 in the mountains of the Liautung Peninsula, where I collected several examples.

143. **Iynx torquilla** L.

Yunx torquilla D. & O. p. 55.

Iynx torquilla La T. p. 576.

The Wryneck is a common migrant in north-east Chihli. It passes during the last week in April and in May until about the 20th of that month. The autumn passage is short and takes place at the end of August and beginning of September. I have seen the bird at that season from the 29th of August to the 5th of September, and once only on the 16th of September, and on the 24th of September (1916).

144. **Alcedo ispida bengalensis** Gm.

Alcedo bengalensis D. & O. p. 74; La T. p. 576.

The Common Kingfisher arrives in May, probably early in the month, and is not uncommon during the summer. I have three eggs taken at Hsieh Chia Ying marshes on the 8th of July and four on the 10th of the same month. They vary in length from 0·80 to 0·82 in., and in breadth from 0·70 to 0·72 in., and average 0·81 × 0·707 in.

145. **Eurystomus orientalis calonyx** Sharpe.

Eurystomus orientalis D. & O. p. 73.

I saw a Broad-billed Roller at Chinwangtao on the 5th of September, 1917, the only one seen there during a seven years' stay in that locality. An immature male shot near Shanhaikuan in September 1918 was subsequently sent to me.

146. **Upupa epops** L.

Upupa epops D. & O. p. 79 ; La T. p. 576.

The Hoopoe is one of the most conspicuous spring migrants at Chinwangtao, and may be seen commonly at that season from about the middle of March to well on in May. In 1912 I saw it from the 11th of March to the 13th of May. In 1913 the collectors saw three on the 31st of May, but these were probably local breeding birds. The occurrence of this bird at the port during the return passage is apparently irregular. I saw one on the 3rd of August, 1911, none in 1912. In 1913 I saw one on the 13th and on the 17th of August and three on the 22nd of the same month in 1914, one on the 18th of August, and one on the 20th of August, 1916. In 1911, one was shot inland on the 15th of November. It is probable that a few remain here all the year round.

The Hoopoe is found on the plains in southern Manchuria during the summer.

147. **Cypselus apus pekinensis** Swinhoe.

Cypselus pekinensis D. & O. p. 68 ; La T. p. 576.

The North China Swift breeds at Peking, Tientsin, and Shanhaikuan. At the latter place it nests in holes of the city wall. It arrives there towards the end of April. The appearance of this Swift at Chinwangtao is irregular. I have seen a few during May and in summer which were probably visitors from Shanhaikuan. It probably leaves early on its return to the south, as on the 25th and 27th of July, 1915, I saw some at the port which were evidently migrating.

148. **Cypselus pacificus** Lath.

Cypselus pacificus D. &. O. p. 69; La T. p. 576.

The Large White-rumped Swift passes Chinwangtao in spring from mid-April to early in June. During the month of June and throughout the summer, more or less large flocks appear often at the port, coming from an easterly or north-easterly direction, and remain hawking over the island sometimes all day. The usual time of their coming, however, is in the late afternoon. It is evident that these are summer visitors breeding somewhere in this vicinity. Large numbers of migrants pass from about the middle of August to the last ten days of September.

149. **Acanthyllis caudacuta** Lath.

Chætura caudacuta D. & O. p. 70.

A few Spine-tailed Swifts pass in September. I saw a couple on the 17th of September, 1911, flying in company with swallows, wagtails, and white-rumped swifts, another on the 13th of September, 1914, and one on the 17th of September, 1916.

150. **Caprimulgus indicus jotaka** T. & S.

Caprimulgus jotaka D. & O. p. 67 ; La T. p. 577.

The Japanese Nightjar passes regularly in spring from about the middle of May to the beginning of June (latest record 10 June). I have seen a few examples during the autumn passage at the end of August and in September (earliest record 27 August, 1915, latest record 21 September, 1912, or possibly 26 September, 1915).

I saw an example of this Nightjar on the plain near Newchwang on the 26th of May, 1889, and noticed the bird also that year in August.

151. **Cuculus canorus telephonus** Heine.

Cuculus canorus D. & O. p. 65 ; La T. p. 577.

The Common Cuckoo arrives in May. I heard it calling at the hills on the 21st of May, 1911, and in 1913 it was seen as early as the 11th of that month. I shot one on the 2nd of June, 1912, and saw others on the same day. It most probably breeds in this district. I saw Cuckoos on the 25th and 27th of August and 7th of September in the country and at Chinwangtao itself on the 3rd of September, which from their size appeared to be of this species. A young male, shot about the 1st of September, has a wing-measurement of 8·25 in. The upper parts are dark brown, barred with rufous except on the rump and upper tail-coverts which are rufous and grey, most of the feathers are fringed with white or whitish. There is a white spot on the nape. From the chin to the breast the feathers are edged with blackish, more broadly on the chin and throat.

A young bird was brought to me from the hills on the 15th of July, 1917, which, so its captor told me, had been taken from a Meadow-Bunting's (*Emberiza cioides*) nest. The upper parts were ashy brown, each feather narrowly edged with white. There was a white spot over one eye and one on the occiput. The throat was white barred with black, the rest of the under parts was buffy white, narrowly barred with blackish grey, the sides of the head were speckled with white. Legs orange-flesh, bill greenish black, gape and base of lower mandible yellow, mouth orange-vermilion, iris brown. On the 21st of July it could fly quite well. I fed it on minced or chopped raw beef, green-bean paste and bread and milk, its favourite food being raw beef. On the 24th it was getting quite wild and showed a desire to pick up its food unaided. On the 26th it fed unassisted and when approached would peck at one's fingers and fly off. I released it on the 5th of August, when it flew well. On this day the iris of this bird was greyish brown, the rim of the eyelid was greenish grey, the bill orange-flesh with the culmen and the point of the lower mandible dark green, the mouth was orange-red. The bird had been wild for some days, fiercely pecking at one's hand and flying off without touching the food offered to it so long as it was held in one's fingers.

152. **Cuculus saturatus** Hodgson.

Cuculus striatus D. & O. p. 65.

I found on the beach at the port on the 7th of June, 1911, an almost skeletonized specimen in hepatic plumage of the Himalayan Cuckoo. Wing 7·35 in. The specimen was sent to the Natural History Museum. Another example, a female in hepatic plumage also, wing 7·80 in., was shot here on the 29th of August, 1913. It agrees fairly well in all but size with a female from Fohkien.

I am indebted to Mr. A. de C. Sowerby for the loan of an adult female example shot by him in southern Manchuria (Fengtien Province) on the 3rd of June. The wing of this bird measures 7·13 in.

153. **Asio otus** (L.).

Otus vulgaris D. & O. p. 41.

Asio otus La T. p. 577.

The Long-eared Owl is a very common migrant at Chinwangtao during spring. It passes at that season during the last ten days of March until the last week of April. It is again seen throughout October and November. I saw one at the port on the 9th of December, 1913.

154. **Asio accipitrinus** (Pallas).

Otus brachyotus D. & O. p. 41.

I have an example of the Short-eared Owl shot in the autumn of 1912, and another shot out of a party of nine or ten flushed out of a patch of grass on the plain on the 15th of November, 1914. The latter birds were evidently accompanying the larks which passed that day in immense flocks. The one I shot had breakfasted off one of the larks. I have no other certain records, and this Owl, although probably common enough, is certainly rarer here than in south-east China, where it is a very common winter visitant. The Long-eared Owl, on the contrary, is quite a rarity in Fohkien.

155. **Bubo ignavus** subsp.

Bubo maximus D. & O. p. 39.

The Great Eagle-Owl is a common resident. It appears on the plains in winter, where I shot one on the 10th of November. The natives often shoot this bird in winter and bring the skins to the port for sale.

The Great Eagle-Owl is a common resident in southern Manchuria.

156. **Nyctea scandiaca** L.

A handsome male example of the Snowy Owl was shot close to Chinwangtao on the 16th of December, 1916. The flanks and scapulars are barred with brown, and the wings, tail, and upper parts are sparsely spotted with the same. Iris bright yellow, rim of eyelids blackish brown, bill and claws greyish brown, mouth pink, soles of feet white. Wing 16·5 in., tail 8·8 in., total length 23 in.

The Snowy Owl has not previously been recorded from China. The above-mentioned specimen had probably been driven south by bad weather, as shortly after its capture the weather, which had till then been mild for the season, turned suddenly cold and severe gales with a heavy snowfall then prevailed over North China and the North Pacific.

157. **Otus scops stictonotus** (Sharpe).

Scops stictonotus D. & O. p. 42.

The Chinese Little Scops Owl is not uncommon on passage. I have several local examples: one shot on the 15th of September at the port and the others dated 14 September, early October, and 8 May, from Shanhaikuan and a short way inland of Chinwangtao.

This little Owl passes Newchwang in May.

158. **Athene noctua plumipes** Swinhoe.

Athene plumipes D. & O. p. 37.

Swinhoe's Owlet is common in winter on the plain.

I obtained a live example at Newchwang in 1899, which was brought to Europe and eventually found a home at the Zoological Gardens in London.

159. **Ninox scutulata** (Raffles).

Ninox scutulata D. & O. p. 36.

Ninox japonica La T. p. 577.

An example of the Brown Hawk-Owl was shot by the collectors on the 16th of May, 1913. I believe that I saw one at Shanhaikuan on the 10th of October, 1914, and I saw another at Chinwangtao.

This Owl passes Newchwang in May.

160. **Pandion haliaëtus** (L.).

Pandion haliaëtus D. & O. p. 14.

The Osprey is occasionally seen passing on migration. I have only two spring records: one (uncertain) 21st of

April, and one bird seen flying over the big pond at the back of the port on the 17th of May, 1916. It passes also during September and October, and one was noticed on the 13th of November, 1911.

161. **Aquila chrysaëtos** (L.).

Aquila chrysaëtus D. & O. p. 7.

A handsome immature female example of the Golden Eagle was brought to me on the 21st of November, 1915. It had just been shot a few miles outside the Great Wall, north-east of Shanhaikuan. The soft parts were as follows: Iris hazel brown; cere and gape pale yellow; bill horn-colour, blue at the base; feet pale yellow. Its proportions are: Bill from gape 2·5 in.; wing 24·80 in.; tail 12·80 in.; tarsus 4·50 in.; total length, 33 in. The tail is white or grey with a broad terminal black band. The skin of an adult was offered to me for sale on the 11th or 12th of April, 1916. The tail in this specimen was grey, waved with brown. Père David mentions the Golden Eagle as being common in the mountains of Chihli. It is doubtless a resident in this part of the province.

162. **Aquila nipalensis** Hodgson.

Aquila clanga D. & O. p. 9.

I have an example of what I take to be the Eastern Steppe Eagle, from Chihfeng in outer Chihli, for which I am indebted to Mr. A. L. Hall. This bird is apparently adult. The tail is obsoletely barred with greyish. In its dry state the bill is blackish, the cere yellow, feet pale yellow. The nostrils are oblong and obliquely pierced. The proportions are as follows:—Bill from gape 2·9 in.; culmen from cere 1 in.; wing 24 in.; tail (worn) 11·5 in.; tarsus 3·7 in.; middle toe without claw 2·5 in.

163. **Aquila clanga** Pallas.

Aquila nævia D. &. O. p. 11.

Aquila clanga La Touche, Ibis, 1907, p. 11.

On the 6th of October, 1912, I bought a live example of this Eagle from the hawk-catcher at the marshes, and after taking its description and measurements released it. It was in the deep purplish brown and spotted plumage of the immature bird. The iris was dark brown, the cere and feet yellow, the bill leaden-blue tipped darker; the wing measured 19·4 in. I saw another on the 12th of October, 1913, at the marshes, and shot, but failed to secure, what was presumably a third example on the 16th of September, 1915.

164. **Butastur indicus** (Gm.).

Butastur indicus D. & O. p. 18; La T. p. 577.

My collectors saw the Grey-faced Buzzard-Hawk in 1913, on the 2nd and 7th of May. I believe that I saw one migrating along the dunes by the seashore on the 20th of September, 1914. Père David says that it breeds in the mountains near Peking.

165. **Haliaëtus albicilla** (L.).

Haliaëtus albicilla D. & O. p. 12.

The White-tailed Sea-Eagle is a common migrant in spring and autumn. I have an immature bird shot on the 6th or 7th of March and an adult female example shot outside the Great Wall towards the middle of December, 1915, so that some probably winter in north-east Chihli. The measurements of this bird are: Total length 33·6 in.; wing 26·5 in. Bill, cere, and legs yellow.

The local hawk-catchers use this Eagle as a decoy, pegging the bird down at their nets. The owner of two of these birds told me that he fed them in summer on fish and in winter on puppy dogs!

166. **Milvus melanotis** T. & S.

Milvus melanotis D. & O. p. 16; La T. p. 577.

An important migration of the Black-eared Kite goes on during spring and especially in the autumn. My earliest spring record is the 23rd of February, 1913, when I saw one flying up the coast, but the bulk of the migrants pass in April. The autumn passage goes on throughout September and until the middle of October. Numbers of these birds are taken at this season by the hawk-catchers. Those which

I saw were all immature birds in spotted plumage. A few summer here in suitable spots.

167. **Circus cyaneus** (L.).

Circus cyaneus D. & O. p. 27; La T. p. 577.

The Hen Harrier passes during April and again at the end of September and during October. A few winter in the vicinity. Adult males are often seen in autumn.

168. **Circus melanoleucus** (Forster).

Circus melanoleucus D. & O. p. 29; La T. p. 577.

The Pied Harrier passes in April and May and again from the end of August to perhaps the middle of October. It is by far the most abundant of all the Harriers in this part of Chihli and is often seen travelling in parties. Adults are quite common.

On the 25th of September, 1912, while out duck-shooting at the marshes, I chanced on a number of Harriers which were fishing (for frogs presumably) after sunset by moonlight. I did not ascertain the species. On the 12th of September, 1915, I noticed another such gathering of Harriers at the marshes at sundown. The birds on this occasion were, I believe, Pied Harriers.

This Harrier was noticed by me on the plains near Newchwang during June.

169. **Circus æruginosus** (L.).

Circus æruginosus D. & O. p. 30.

The Marsh Harrier is extremely abundant during September and until well on into October.

My first list of Chinwangtao birds (Customs Decennial Reports, 1902–11, Chinwangtao Report, p. 173; Shanghai, 1913) mentions *C. spilonotus*, but I find that I have no certain records of this bird and therefore omit it in the present paper.

170. **Buteo buteo japonicus** (T. & S.).

Buteo japonicus D. & O. p. 19.

Buteo plumipes La T. p. 577.

The Common Buzzard passes in spring from February to May and abundantly during September and October, as also I believe in November. Père David writes of it as being rare at Peking, so that probably in North China it passes chiefly along the coast. I saw one at sea on the 7th of November, 1910, which settled on board the steamer we were travelling on, the position of the vessel being about thirty miles north of Modeste Island.

171. **Buteo ferox hemilasius** T. & S.

Buteo hemilasius D. & O. p. 19 ; La T. p. 577.

The White-tailed Buzzard passes during March and April and in October and November. I have seen examples used as decoys by the hawk-catchers, who capture many during times of passage. A fine specimen purchased from one of these men is entirely brown with the exception of the head. The soft parts of this bird were:—Iris pale straw-yellow mixed with a little hazel; legs dirty yellow. The amount of feathering on the tarsus of this bird is very variable, sometimes the whole front of the tarsus is feathered and in other specimens quite a third of the tarsus is bare.

172. **Astur palumbarius schvedowi** Menzbier.

Astur palumbarius D. & O. p. 23 ; La T. p. 578.

I saw on the 21st of March, 1913, a freshly shot example in the market, and on the 23rd of January, 1916, I purchased in the market a fresh native skin of a fine adult bird, female by size, which was made into a handsome specimen. Wing 14·10 in.

I have seen on several occasions during autumn small Hawks passing which were probably *Astur soloensis* or *A. cuculoides*, but have not so far procured specimens.

173. **Accipiter nisus** (L.).

Accipiter nisus D. & O. p. 27 ; La T. p. 578.

The Common Sparrow-Hawk passes in April and May and from the middle of September to the end of November.

A number winter in the vicinity. It is, as elsewhere in China, a very common bird. The female is much used by natives for hawking quail in autumn. The birds, when not fully trained, are flown with a string attached to their jesses. The string is neatly wound on a bobbin enclosed within an open wire case. The falconers generally go in couples or small parties; one man beating the cover with a stick. On a bird being flushed the hawk is thrown at it and almost always catches the quarry after a very short flight. The hawks are not hooded. One of these trained hawks, which had escaped, once attacked some caged birds which were hanging in our verandah and was easily captured by offering it some food. After attempting to snatch the meat from my hand and to fly away with it, it settled on a portion of a hare I was holding out and was thus caught.

174. **Accipiter gularis** T. & S.

Accipiter virgatus D. & O. p. 26 (part).

The Japanese Sparrow-Hawk appears to be common during September and the early half of October. It is often caught by the natives and trained to catch quail and small birds. A live example was obtained on the 2nd of September, 1915. It was a young male of the year with the under parts deeply tinged with buff. The iris was of a yellowish emerald-green.

175. **Pernis apivorus orientalis** Tacz.

Pernis apivorus D. & O. p. 18.

Pernis elliotti La Touche, Ibis, 1913, p. 279.

An old, much torn skin of a Honey-Buzzard was seen on the 21st of March, 1913, hanging in a shop in the market. I did not examine it closely, but it appeared to be the skin of an Indian Honey-Buzzard, which is the species found on the China coast and no doubt also in Japan. I saw at Chinwangtao, on the 16th of September, 1912, and again four days afterwards, large hawks flying overhead which I took to be Honey-Buzzards. I saw another at the marshes on the 16th of September, 1915, which appeared to be the same.

176. **Falco cherrug milvipes** Jerdon.

Falco saker D. & O. p. 31.

Falco sacer La T. p. 578.

The Shanghar Falcon passes in spring and in October and November. It most probably winters in north-east Chihli. This Falcon is a favourite decoy bird at the hawk-catchers' nets. The lure employed to catch this bird is a live pigeon pegged down near the concealed net. A few of these Falcons are caught every year and are held in high esteem by Chinese falconers. They are used for hawking hares. Two birds are generally flown together.

177. **Falco peregrinus** L.

Falco communis D. & O. p. 32.

Falco peregrinus La T. p. 578.

The Peregrine passes Chinwangtao in April, May, and June. It is probable, however, that those seen during the latter month are summer visitants. It is seen also in autumn until well into November. I have also seen this Falcon pegged out at the hawk-catchers' nets, and it is valued for hawking purposes.

178. **Falco subbuteo** L.

Falco subbuteo D. & O. p. 33; La T. p. 578.

A few Hobbies were noted in 1913 from the 16th to the 20th of May.

179. **Æsalon regulus** (Pallas).

Falco æsalon D. & O. p. 34.

Æsalon regulus La T. p. 578.

The Merlin passes in March and April and again from September to December. Some probably winter in the district.

180. **Erythropus vespertinus amurensis** (Radde).

Falco amurensis D. & O. p. 34.

Erythropus amurensis La T. p. 578.

The Eastern Red-legged Falcon is a very common summer visitant in the district. It arrives in the latter half of April, and some are to be seen until the end of October. Twenty-eight eggs, some fresh, others more or less incubated, were brought to me from the mountains, north of Chinwangtao, on the 25th of June, 1917, and a clutch of three, slightly incubated, from the same locality on the 2nd of July following. I saw on the 16th of September, 1915, numbers travelling along the sea-shore, hovering and feeding on the dunes as they passed by.

181. **Cerchneis tinnunculus japonicus** (T. & S.).
Falco tinnunculus D. & O. p. 36 (part).
Cerchneis japonicus La T. p. 578.

The Japanese Kestrel passes in spring and in September and October. A few winter in the vicinity. Some breed in the mountains to the north of Chinwangtao. A clutch of four slightly incubated eggs was brought to me with the female on the 3rd of May, 1917.

[To be continued.]

XXXIV.—*Some preliminary remarks on the Altitude of the Migratory Flight of Birds, with special reference to the Palæarctic Region.* By Col. R. Meinertzhagen, D.S.O., M.B.O.U., F.Z.S.

A great deal has been written on this little-known subject, but in nearly all cases theories have been advanced which have been supported by unsatisfactory evidence, or by evidence of a very scanty nature.

Let us see what evidence is available.

Gætke affirms that the altitude of migratory flight under normal conditions is so great as to be completely beyond the powers of human observation, whilst he regards such portions of it as are brought within our notice as disturbances and irregularities of the migratory movement. In other words, he considers visible migration to be abnormal and invisible migration to be normal. Gaetke is careful to explain that by normal migration he only means those large extensive movements which carry birds in one uninterrupted, and for the most part nocturnal flight, from their starting point to their destination. He further considers that the height of normal migration is at least 20,000 feet. It must be remembered that Gaetke's observations were confined to Heligoland, and that he occasionally allows his enthusiasm to outrun his facts, but this does not in the least lessen the charm of his delightful book.

Whitlock ('Migration of Birds,' 1897, pp. 56-88) challenges Gaetke's statements and notes the unsatisfactory evidence on which his theories are based. But sound theories can be arrived at by conviction if based on a wide experience, even though such theories cannot be scientifically proved. Gaetke's theory is non-proven, but is based on experience such as no other ornithologist can claim. Whitlock gives us no evidence to enable us to arrive at the truth, though he produces much destructive criticism.

Now let us turn to some very definite evidence. On October 19, 1880, at Princeton in New Jersey, W. E. D. Scott (Bull. Nuttall Ornith. Club, vi. pp. 97–100) saw large numbers of birds passing across the face of the moon, when observing through an astronomical telescope. It was estimated that these birds were at an altitude of between 5000 and 10,000 feet. On April 16, 1881, further observations were made at the same place, but only some low-flying Swallows were seen on the northward passage.

Chapman (Auk, 1888, pp. 37–39), also in New Jersey, watching for nearly three hours on the evening of Sept. 3, 1887, observed 262 birds cross the face of the moon. Of these, 233 were estimated to be at a height of from 1500 to 15,100 feet. It was observed that the lower-flying birds seemed to be flying upwards and were seeking "the proper elevation at which to continue their flight." Among the birds recognised were five Carolina Rails, of which three were thought to have been between 1900 and 10,200 feet, one between 2000 and 11,000 feet, and one between 2600 and 13,500 feet.

In 1905, Carpenter (Auk, 1906, pp. 210–217) conducted some experiments by night in May and October, with a view to observing birds passing the face of the moon. In May no bird was observed flying at over 2400 feet, the lowest flying at 1200 feet. In October birds ranged from 1400 to 5400 feet.

Lucanus, who appears to be much interested in this subject, finds (J. f. O. 1902, pp. 1–9) that migrants generally travel at under 3300 feet above the earth and always below the lowest clouds. A very high altitude is unnecessary for birds, because, according to aerial observations, the perspective disappears at over about 3300 feet. Again (J. f. O. 1913, pp. 117–124) he finds from observations made from German air-ships, that the flight of birds is very seldom at altitudes of over 1200 feet, whilst no birds have hitherto been detected at an elevation exceeding 3000 feet.

The following is an important scrap of evidence from India. Donald (Journal Bombay Nat. Hist. Soc. xxv. 1917, p. 302), when in the Himalaya at 14,000 feet above sea-level, observed "Storks and Cranes" flying in a north-easterly direction at the end of May. They were not visible to the naked eye, and could only with difficulty be seen through glasses. Now I have seen Geese at an altitude of over 4000 feet. They were difficult to pick up, but once seen were easily followed with the naked eye. If Donald's Cranes were invisible to the naked eye, they must have been at least 6000 feet above ground level.

Evidence from British Lighthouses is all too meagre. At the Tuscar Rock, Patten ('Zoologist,' 1913, p. 182) estimated Pipits to fly at 70 feet above the sea, Swallows between 40 and 100 feet, and Wagtails at about 120 feet. At the Eddystone, Eagle-Clarke (Ibis, 1902, pp. 246–269) estimated Meadow-Pipits to fly at about 20 feet above the sea, and Wagtails between 130 and 200 feet.

Ingram (Ibis, 1919, pp. 321-325) gives the following evidence as a result of interrogating some five or six hundred pilots of the Royal Air Force between 1916 and 1918, all records being from north-eastern France.

Lapwings.—14 records between 2000 and 8500 feet, the majority between 5000 and 6000 feet. In flocks on both passages, the earliest spring record being on 1. ii. and the earliest autumn record being on 15. vii.

Lapwings.—26. ii. 17 at 6000 feet, flying at 50 m.p.h. air speed against a strong N. wind, when the surface wind was south.

Geese or Duck.	26. xi. 15.	3000 feet.	Flock of 500. Wind N.N.E. at 50 m.p.h., birds travelling due S.
Geese.		9000 8000 3000	
Cranes?	August.	15,000	2 birds.
Crane?	4 April.	8000	1 bird.
Linnets?	22. viii. 15.	10,000	A flock.
Rooks.	March 1917.	6000	50 birds.
Rook?	10. vii. 18.	3000	Flying S.W.
Starlings.	?	3500	
Fieldfares?	March 1917.	3500	
Sandpipers.	March 1917.	12,000	Flying east.
Waders.	?	10,000	
Waders.	18th. Dec.	9500	Flying south.
Whimbrel.	Early March.	4000	Flying N.E.
Herons.	?	3000	

Before I received a copy of this number of 'The Ibis,' I had already put an advertisement in 'The Times' asking pilots for any notes on this subject. All pilots agreed that birds were seldom seen at over 2000 feet or so, and that if birds were observed it was a noteworthy phenomenon. Also that if birds had been about they would most certainly have been spotted by the trained observers watching for hostile aircraft. The results are given overleaf, but, as was to be expected, I received many replies of the following nature. "On April 1st I was surprised to meet 40 cock Ostriches at 17,000 feet. I attacked them at once and broke up the formation. One nose-dived on to the General's tent whilst another crashed into our cook-house."

The saner correspondents gave me the following details:—

Species.	*Date.*	*Height* feet.	*Place.*	*Remarks.*
Lapwing.	9. iii. 18.	6500	N.E. France.	Flying north.
Duck.	11.45 A.M. 26. xi. 15.	7500	N.E. France.	Flock of 8–10 flying south in a snowstorm.
Rooks.	An evening in May 1916.	11,000	Salisbury.	Flock of 60–70 flying S.E.
Kestrel.	Jan. 1916.	7000	Birmingham.	Single bird.
Golden Plover.	10.30 A.M. 25. xii. 16.	6600	Gallipoli.	Flock of 14 flying E.S.E. Clear day with slight W.S.W. wind.
Lapwing.	1. x. 17.	8000	Eastbourne.	Flock of 400 going S.S.W.
Geese.	Feb. 1917.	700	Firth of Forth.	
Gannets.	?	?	Eastbourne.	Thousands going in an easterly direction at below 1000 feet.
Lammergeier.	20. iii. 18.	11,000	N.E. Italy.	Single bird.
Plover.	21. xii. 16.	1400	N.E. France.	Two lots of 15 flying due north. There was a continuous layer of cloud from 700–1200 feet.
Pigeon?	10.30 A.M. 11. iii. 17.	8000	N.E. France.	Flock of 25.
Birds sp. inc.	11 A.M. 15. viii. 18.	10,500	N.E. France.	Flock of 20.

In addition to the above, Capt. Wynne, writing to me in December 1918 notes the remarkable lack of bird-life at over 1000 feet when observing from an aeroplane, though he was constantly on the look-out for birds when flying. He only met birds at over 1000 feet on two occasions, and knew of two cases where Geese had been seen at 6000 feet in France by our pilots, but could not give further detail.

The following information was given to me by two officers who flew for two years in Mesopotamia. Swifts were seen at 6000 feet over Mosul in July, but were not on passage. White Storks were seen migrating in April at 4200 feet over Baghdad, and Geese and Duck were frequently met with soon after dawn passing north on spring migration, but usually between 2000 and 3000 feet.

I also glean the following notes from the 'Field.' Plover (Field, 22.ix.17) were met with at 6000 feet on 6.ix. in N.E. France, flying north with a 25 m.p.h. wind from the south. Again on 5. iii. Capt. Portal (Field, 17. iii. 17) saw a large flock of Lapwing at 5000 feet flying due north. The ground wind was 5 m.p.h. from the south, but at 3000 feet and over it was north-west and blowing 30 m.p.h., whilst at 5000 feet it was nearly due north.

My own observations from the air are confined to a solitary instance, though I frequently flew in both Palestine and East Africa when migration was in full swing. It occurred in early April at about 7 A.M. in East Africa, when at 5200 feet over the southern slopes of Kilimanjaro we encountered a large scattered flock of Lesser Kestrels and Bee-eaters (*Merops apiaster*), making their way north against a slight head wind. The day was one of those perfect African mornings, and the sun shining on the brilliant hues of these birds wending their way north to their nurseries, against the glistening snows of Kilimanjaro, was one of those scenes never to be forgotten.

During the recent war I was able to make the following observations on diurnal migration, in each case the height of flight being obtained by the use of theodolites on a wide base.

British East Africa.

Red-throated Pipits.	210 feet.
Wagtails.	160–240 feet.
Swallows.	210, 235, and 240 feet.
Rollers.	720, 840, 850, and 860 feet.
Kestrels.	150–310 feet.
Caspian Plover.	480, 490, 830 feet.

(All taken in the early morning in clear still weather on autumn passage.)

Southern Palestine.

Pelicans. 1240 feet. A clear still October afternoon, birds travelling south-west.

North-west France.

Rooks. (3 cases) 1740, 2008, and 2120 feet, all taken on still evenings in late October. Birds flying west.

Rooks and Jackdaws. 690 feet. Flock of over 200 mixed birds flying west on a clear evening.

Green Plover. 1410, 4346, 6210, and 6870 feet. All in flocks and flying south-west soon after daylight in early October. Weather calm and clear.

Geese. 4240 feet. A skein of 17 flying west by south on a clear frosty November evening just before sunset.

Hooded Crows. Observed passing along the coast near Boulogne, never over 300 feet up. Weather dull but sometimes clear.

All passage of Larks, Finches, and Buntings was observed at only a few feet above the ground.

Finally, I give a few scraps of evidence culled from various sources.

Rooks. High flyers over Heligoland. (Gaetke.)

Hooded Crows. Low flyers over Heligoland. (Gaetke.)

Skylarks. Heligoland. They pass between 1000–2000 feet in clear weather, and at 200 feet in damp dull weather. (Gaetke.)

Richard's Pipit. Their migratory flight is high when passing Heligoland. (Gaetke.)

Pericrocotus cinereus. Southern China. They fly high when travelling. (Ibis, 1913, p. 36.)

Song-Thrush. Heligoland. They fly high in clear weather, but low in damp dull weather. (Gaetke.)

At Jericho on a dull November morning with clouds as low as 200 feet, I watched hundreds dropping like stones into a banana plantation soon after daylight. They came *through* the cloud and not from below it.

Hedge-Sparrow. They migrate at 200 feet in Heligoland. (Gaetke.)

Wren. Patten (Irish Nat. 1912, p. 125) thought they were low flyers on migration.

Hoopoe. Several seen arriving off the coast of southern Palestine, flying but a few inches above the sea when about 10 miles from land.

Rollers. Port Said. Individuals seen arriving and descending from a height. (Lynes.)

Sparrow-Hawk. They travel at a great height over Heligoland. (Gaetke.)

At Jerusalem I watched Sparrow-Hawks continuing their spring passage in 1920. They would soar up to some 1500 feet or so, and then make off in a northerly direction in the clear still evenings just before sunset.

Honey Buzzard. They travel at a great height over Heligoland. (Gaetke.)

This is confirmed by Irby's observations at Gibraltar, though they travel low in bad weather.

White Stork. Akaba, Sinai. Seen passing north on spring passage at 300 feet (Zedlitz, J. f. O. 1912, p. 337).

On 6. iii. I saw many large flights of these birds passing north over Lake Galilee at 400 feet above the Lake. On two occasions when Storks were passing up the Jordan Valley at about 400 feet, they would see a Neophron or Kite soaring in an air spiral; the Storks never failed to branch off and join in this natural assistance to gain height, and would then continue their journey at about 4000 feet above the Jordan Valley, but only some few feet above the surrounding hills.

Crane. Pyrenees. Observed passing over the Pyrenees at 1500 and 1800 feet, but in Bulgaria they were noted crossing the Rhodope Hills (Boetticher, J. f. O. 1919, p. 239) at no great height.

On a still October evening on the desert 40 miles east of Damascus I watched the autumn arrival of large "wedges" of Crane. They descended to a lake from a height I estimated at about 4000 feet, arriving from the north. With my glasses I could see party after party at many miles' distance, approaching the lake. Birds did not attempt to lose height till well over the lake.

Quail. Southern Palestine. Seen arriving at daylight on the coast near Rafa, passing over the sea just above the water, many parties continuing their passage south over land only a few inches above the ground. Lynes also noted Quail arriving near Port Said and flying low.

Stock Dove. They travel on migration at about 100 feet on autumn passage over Orenburg. (Grote.)

Such is the all too scanty evidence, and it will be seen at a glance how little refers to nocturnal movements: but as evidence of nocturnal movement, we must accept the observation of birds arriving after a migratory flight, and the calling of migrating birds which is so frequently heard by night.

All evidence of the arrival of birds after a long migratory flight points to the fact that no excessive height is reached during flight. The Cranes at Damascus, and Quails and Hoopoe at Port Said and Rafa, do not indicate excessive height.

As regards the calling of migrants by night, such noises, when heard on clear still evenings, must be accepted as evidence under normal conditions. Now the European Bee-eater is an excellent example, because it is an incessant caller when migrating; it travels by both day and night, and is common enough and of sufficiently wide distribution to give us ample opportunities of observation. I have observed daylight passage in East Africa, Baluchistan, Palestine, and in Egypt, and have always endeavoured to note the altitude of flight and accustom myself to the degree of intensity of the note at the various elevations. Results from such guess-work are necessarily unsatisfactory but constitute a guide.

I have never heard Bee-eaters passing without being able to locate them, though sometimes they could not be discovered *ab initio* without the aid of binoculars, and I doubt whether any such diurnal flight as observed by me extended to over 3000 feet. An argument may be advanced that others were passing out of sight and hearing; but I would mention that the Bee-eater's call carries far. I recently in Crete, when at an elevation of 6000 feet, heard a flying Raven croaking loudly up in the skies as he was returning from the coast to Mount Ida. From where I was sitting I had a panoramic view of a large part of southern Crete, and the Raven was more or less level with me. It was some time before I could pick him up with my glasses, and he then settled in a tree some two miles from me. I see no reason why a flock of Bee-eaters should not be heard at well over that distance when flying overhead, but I very much doubt if they would be visible to the naked eye at over two miles, and even with glasses I doubt the possibility of picking them up. We know that sound travels better vertically down to the earth than horizontally along it. An aeroplane at 17,000 feet is distinctly audible, but would not be heard at 3½ miles horizontal distance. Now I never heard a Bee-eater call at night at a greater distance from the earth than by day, which induces me to believe that they do not pass at much over 3000 feet by either day or night. If, according to Gaetke's theory, they were passing at about 20,000 feet, they would be invisible and inaudible whether by day or night.

Many other instances could be quoted showing that on clear still nights—normal conditions—migratory flight is clearly audible from the earth's surface, which tends to prove that nocturnal migration is performed below 20,000 feet and probably not much above 3000 feet.

The thousands of birds which annually strike the lantern-glasses of lighthouses do not constitute evidence of the altitude of migratory flight, as this nearly always occurs under abnormal conditions—fog, mist, rain, etc.—when all migration descends to near the earth's surface or sea-level. I know of no instance of a migration "rush" at a lighthouse in clear weather.

The fact remains that migration "rushes" are rarely witnessed except at lighthouses when unsuitable weather conditions brings migrants down to a very low level, or when migration has been checked or "banked up" on account of fog, rain, or storm. Though frequently seen in detail, migration is but seldom witnessed in bulk. Masses of migrants may be met with in a certain district and on a certain day, but how seldom one sees those hosts in movement by day or hears them passing by night.

I recently made some enquiries about the number of duck and quail which are annually slaughtered for the market in Egypt. Near Port Said alone over 600,000 Duck are killed yearly, and over three million Quail are exported annually from Egypt, and these colossal figures only represent a part of the total butcher's bill. Who sees these millions arrive or depart? Who ever hears or sees them moving. I have but one record—a wonderful experience—by an eye-witness, and that was of Duck passing north *en masse* near Port Said in the spring of 1920. From the description it was a sight that few are privileged to see.

So in this respect we must accept Gaetke's theory that invisible migration is the normal, but I cannot agree that migration takes place at such elevations as 20,000 feet. And the reason that normal migration is generally invisible can only be that most birds travel by night. This is confirmed by the fact that so little migratory movement has been observed from aeroplanes, when we realize that in north-eastern France, Palestine, Mesopotamia, and East Africa the air has been so thoroughly watched throughout several migratory seasons.

It is indeed tempting to assert that migratory movement proceeds above the possibility of normal observation from aeroplanes—say at 20,000 feet or over. But our evidence does not allow of this. In fact, the nearer we get to 20,000 feet, the scantier becomes our evidence. Omitting for the moment the American telescopic observations by moonlight, let us take all instances of birds observed in flight at 5000 feet or over, and we have :—

15 cases of Lapwing,
4 ,, ,, Geese,
3 ,, ,, Crane,
2 ,, ,, Rooks,
2 ,, ,, Waders,
10 ,, ,, other birds ; or 36 cases in all.

Now of these the Birmingham Kestrel, the Mosul S the Salisbury Rooks, and the Lammergeier were undoubtedly not migrating and need not be considered. Of the remainder, the highest seven recorded altitudes are 15,000, 12,000, 10,500, 10,000 (twice), 9,500, and 8,500 feet. Below 8000 feet observations become more frequent, whilst between 3000 and 5000 feet they are not uncommon. Now aerial observation in France and Palestine extended well above 8500 feet, and if mass migration did occur above that elevation, it could not fail to have been observed even on its outskirts. The very lack of evidence, where evidence should exist, convinces me that flight at over 5000 feet is abnormal whether by day or night.

Regarding the American telescopic observations across the face of the moon, I prefer to believe that Chapman recognized a Carolina Rail by moonlight at under half a mile than at about two miles distance. Though I do not for one moment wish to belittle these most interesting and instructive experiments, I feel that observations with such gigantic margins of estimation should be accepted with care until we get a large series to work on.

Before attempting to reach a final conclusion on this subject, it is necessary to take up the questions of (*a*) The effect of weather on the altitude of migratory flight; and (*b*) The use of sight by migratory birds.

(a) *The effect of weather on the altitude of migratory flight.*

Gaetke states that during both spring and autumn migrations without exception, all species approach in largest numbers to the earth's surface when very light south-easterly winds, accompanied by clear warm weather, happens to prevail for any length of time in the lower reaches of the atmosphere.

Sufficient has been written by students of migration to show that neither velocity nor the direction of the wind has much effect on the altitude of migratory flight. Herman, however (Aquila, i. p. 9), shows clearly that migratory flight is brought nearer the earth in bad weather—storms, fog, mist, etc. (*cf.* also Aquila, x. p. 71), and this has been amply proved by recent observations. No student of migration can have failed to observe that in the height of a migratory passage, passage-migrants are not so much in evidence in clear and still, as in dull or rainy weather. The reason is obvious. Birds, as do our air pilots, like to see the earth, and descend in bad weather to a position where they can see it, or if the weather becomes too bad, flight is stopped altogether. I do not believe that weather has any other effect on the altitude of migration than this.

I frankly do not understand Gaetke's above-quoted statement, for a south-easterly wind in Heligoland would be a dry wind entailing clear weather, and with such weather conditions migratory flight is normal, the altitude of migratory flight not being brought nearer to the surface of the earth.

(b) *The use of sight by migratory birds.*

It is generally accepted that of all animal life, specialization of sight reaches its highest degree of development among birds. Lewis (Emu, xv. p. 217) considers birds to have an acuity of vision 100 times greater than that of human beings. The wonderful eyesight of Vultures, the vision which permits Cormorants to fish in muddy waters or a Kestrel to pick up small beetles when hovering at 200 feet or more, cannot fail to impress us. And I was recently still more impressed when sitting on the snows of Ida's summit in Crete. Out of the clouds rushed hundreds of Alpine Swifts which at once commenced feeding within a few feet of me. Their twists and turns denoted an abundance of food, and although some birds took insects within a few feet of me, I could detect no sign of insect life. On shooting one, I found the birds were catching a minute beetle scarcely so large as a pin's head. To do this when travelling at some 80 miles an hour, does indeed bear out Lewis's comparison of the acuity of vision as between men and birds.

I now wish to quote Dixon ('Migration of Birds') :—

"In no part of the world do any regular migration

> routes cross seas too wide to be bridged by the eye of a bird flying at a sufficient altitude, and 5000 feet is considered sufficient altitude for all practical purposes; but that birds do ascend to 25,000 feet is unquestionable."

Now calculating on the formula $\sqrt{\frac{3.\ V.I.}{2}}$ in feet the following are the horizontal distances in miles at which the horizon is visible from heights in feet. Of course, high ground showing above the horizon would be visible from a lower height, but it takes very high ground to appear above the horizon at 100 miles.

From	500	feet	27	miles.
„	1000	„	39	„
„	2000	„	55	„
„	3000	„	67	„
„	4000	„	77	„
„	5000	„	86	„
„	10,000	„	122	„
„	20,000	„	176	„
„	26,700	„	200	„

I do not know on what Dixon bases his statement that birds unquestionably ascend to 25,000 feet. Nor in the first part of his statement under criticism has he considered the migrations of the Golden Plover of America during either their Atlantic or Pacific passages, nor that of our late-lamented Esquimaux Curlew, of *Urodynamis taitiensis* the long-tailed Cuckoo of New Zealand, or of certain of the Petrels. The least of these migrants would have to ascend to an altitude of over 70 miles in order to satisfy Dixon's theory, and the Golden Plover would be flying far outside the cushion of air which surrounds the earth.

But perhaps Dixon's interpretation of regular migration routes is narrowed to those arbitrary and largely imaginary lines which some naturalists have traced across the world, in the fond hope that birds will abide by them.

Just one word on long-distance visibility. The following instances have come within my personal knowledge. I have seen :—

	miles
1. Mount Ida in Crete from a ship at	110
2. The Peak of Teneriffe from a ship at	120
3. The Island of Rodriguez from Mauritius on clear days and from 1500 feet in the latter island. Distance	125
4. Kilimanjaro Mountain from Nairobi, visible on any clear day.	140
5. The snows of the Himalayas from Meerut on a December evening	150
6. Mount Kenya (17,000 feet) from the Mau Plateau (8000 feet) on a clear dawn	160
7. From an aeroplane at 7000 feet over Hebron on a clear still evening in April 1917, I clearly saw the Dead Sea, the Mediterranean, Mount Hermon, the Gulf of Akaba, and Mount Sinai	200

Add to this a bird's acuity of vision and the clear atmosphere which is attained at a little distance from the earth, and I can see no reason why a migrant in most parts of Europe or Asia should require a greater elevation than 5000 feet or so to pick up landmarks—if altitude is required for picking up landmarks.

I do not believe that birds crossing the wider reaches of the Mediterranean pick up Africa before they lose sight of Europe. If the lower-flying Passeres, Quail, Hoopoe, etc. can do without landmarks as a guide, why should not other birds?

And if altitude is not required for picking up landmarks, surely 5000 feet is sufficient for safety, for local orientation, locating feeding or resting grounds. Lucanus's assertion that perspective disappears at about 3300 feet may be true for northern Germany, but does not hold for mountainous country, where perspective is still good up to at least 7500 feet, especially with a slanting sun.

I must ask my readers to accept, for the purposes of this paper, my view that birds do not rely to any large extent on landmarks to guide them on migration. It is a question outside the scope of this paper, but which I hope to deal with at a near date. I need, therefore, only mention that at night no degree of acuity of vision will assist a bird to pick up landmarks at over say 50 miles, unless such landmarks be the dividing line between the sea and land, or perhaps some snow-clad range. (The snows of Mount Kenya are visible by moonlight at over 60 miles distance.)

But I have seen Quail and Hoopoe at sea on autumn passage in the earliest hours of dawn, when land could not have been visible to them from their position almost touching the surface of the waters. I see no reason to suppose Quail and Hoopoe travel higher by night than by day, and if they do not require the assistance of landmarks by day, why should they require such aid by night?

In this connection, Cooke*, in a very masterful essay, gives a curiously confused statement on this rather confusing subject. He says:—

> "Sight undoubtedly does play a part in guiding the night journeys also. On clear nights, especially when the moon shines brightly, migrating birds fly high and the ear can scarcely distinguish their faint twitterings; if clouds overspread the heavens the flocks pass nearer the earth and their notes are much more audible; and on very dark nights the flutter of vibrant wings may be heard but a few feet overhead."

How can sight play a part in guiding birds on night journeys when on dark nights birds fly but a few feet above the surface of the earth?

As regards an oft-voiced view that greater altitude makes flight easier for a bird, I can only quote the experience of our Royal Air Force, that as altitude increases, the machine has greater difficulty in maintaining its height and speed.

Conclusions.

A great deal more evidence of an accurate nature must be obtained before any definite facts can be ascertained, and the following conclusions must only be regarded as provisional.

1. Birds need not, for the purposes of migration, ascend much beyond 5000 feet above the level of the earth, nor indeed do they.

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* Bird Migration, U.S. Dept. Agricult. Bull. no. 185, 1915, p. 27.

2. Birds met with above 5000 feet are the exception and not the rule.
3. That nocturnal flight need not be higher than diurnal, and that, in fact, it is not.
4. That the bulk of migratory flight is conducted below 3000 feet whether by day or night.
5. That under normal conditions, different species travel at different altitudes, some very low and some invariably high, but that during abnormal weather conditions, all birds are apt to fly low.
6. That during migratory flight, birds prefer to descend to below cloud level, though this is not always the case. Exceptions probably occur when gaps occur in a cloud-bank, or where islands of land continue to be visible beyond or above the cloud area.

XXXV.—*Obituary.*

Claude G. Finch-Davies.

We learn with great regret of the sudden death of Lieut. Finch-Davies of the 1st South African Mounted Riflemen, which occurred at the Castle at Capetown on the 3rd of August last, and was due to a sudden attack of angina pectoris. He was only 46 years of age, and his death is a great loss to South African ornithology.

Mr. Davies in early life joined the Cape Mounted Rifles, and spent the early years of his service in Pondoland and East Griqualand. When the Union of South Africa was formed, his regiment became the South African Mounted Riflemen, and with it he saw a good deal of war service during the late war, obtaining his commission as a Lieutenant in 1915. His wife was a daughter of Capt. Finch of Capetown, and after his marriage in 1916 he assumed the additional name of Finch. His wife and three children survive him.

Lieut. Finch-Davies joined the South African Ornithologists' Union in 1907 and the B. O. U. in the following year, and contributed a number of articles on the birds of Pondoland and East Griqualand to the Journal of the former society between 1907 and 1914. He was also a most accurate and conscientious bird-artist, and many of our readers will remember the series of coloured plates from his brush with which the late Major Horsbrugh's 'Game-birds and Waterfowl of South Africa' was illustrated.

After the war he was stationed at Okanjande in the northern part of the South-West African Protectorate, and wrote an account of the birds which he had there observed and collected for the newly established South African Journal of Natural History. To the pages of 'The Ibis' (1919, p. 167) he contributed an account of *Hieraaëtus ayresi,* which he proved to be identical with Sharpe's *Lophotriorchis lucani*; this was illustrated by a fine plate reproduced from his own painting of this handsome Hawk-Eagle. His premature death at the early age of 46 deprives South Africa of an ornithologist of great promise.

XXXVI.—*Notices of recent Ornithological Publications.*

Baldwin on Bird-banding.

[Bird-banding by means of systematic trapping. By Prentiss Baldwin. Abstract of Proc. Linn. Soc. New York, no. 31, 1919, pp. 23–56; 7 pls.]

Mr. Baldwin's bird-marking has been done, not so much with a view to migration work as to study various other questions in regard to the habits of birds. His method is to band adults as well as nestlings, and he obtains his material by systematic trapping with the American Government Sparrow-trap which causes no injury to the birds when taken. The work has been carried out on two farms, one in Ohio and the other in Georgia, in the middle and southern States respectively.

He states that he finds the same individual bird is caught again and again and often several times on the same day. He hopes in the course of time to bring evidence forward as to the length of life of wild birds, and he has already proved that in many cases birds return to the same spot not only to nest but to winter, and also that birds when migrating often resort to the same feeding places along the migration route year after year. The paper contains full directions for trapping, banding, and recording the observations on a card system so as to easily work up the results.

Bangs and Penard on new Hawks.

[Two new American Hawks. By Outram Bangs and Thomas Edward Penard. Proc. New Engl. Zoöl. Club, vii. 1920, pp. 45–47.]

Accipiter superciliosus exitiosus from Costa Rica and *Elanus leucurus majusculus* from California are described as new subspecies.

Bannerman on Congo Birds.

[On some rare birds from the Belgian Congo, collected by Dr. Cuthbert Christy. By David A. Bannerman, M.B.E., etc. Rev. Zool. Africaine, Bruxelles, vii. 1920, pp. 284–295.]

A collection of birds made in the Uelle river district of north-eastern Belgian Congo for the Tervueren Museum near Brussels by Dr. Christy, consisting of 839 skins referable to 197 species, was prevented from reaching Belgium by the war and was temporarily housed at the Natural History Museum in London. Mr. Bannerman at the request of Dr. Christy examined and identified the specimens contained in the collection, and has in this paper drawn special attention to nineteen of the more interesting species.

Chapman on new South American Birds.

[Descriptions of proposed new Birds from Peru, Bolivia, and Chile. By Frank M. Chapman. Bull. Amer. Mus. Nat. Hist. xli. 1919, pp. 323–333.]

[Descriptions of proposed new Birds from Peru, Bolivia, Brazil, and Colombia. Id., Proc. Biol. Soc. Washington, vol. 32, 1919, pp. 253–268.]

The new species described in these two papers are chiefly from among the spoils obtained by the joint expedition of Yale University and the National Geographical Society to the Urubamba district of southern Peru, 1915–17, and were collected by Messrs. E. Heller, G. K. Cherrie, H. Watkins, and by Mr. Chapman himself.

The following are described in the first paper:—*Microsittace ferrugineus minor*, S. Chile; *Upucerthia dumetoria hallinani*, Chile; *U. dabbenei*, Argentina; *Cinclodes fuscus tucumanus*, Argentina; *Leptasthenura punctigula*, Argentina; *L. andicola peruviana*, Peru; *Siptornis urubambensis*, Peru; *S. punensis rufala*, Argentina; *Pseudochloris uropygialis connectens*, Peru; *P. olivascens sordida*, Argentina; *Atlapetes canigenis*, Peru; *Diglossa mystacalis albilinea*, Peru; *Oreomanes binghami*, Peru; *Tangara cyaneicollis gularis*, Peru; *Amblycercus holosericeus australis*, Bolivia.

In the second paper:—*Micropus peruvianus*, Peru; *Grallaria watkinsi*, Peru; *Grallaricula boliviana*, Bolivia; *Synallaxis stictothorax pluræ*, Peru; *Phacellodomus striaticeps griseipectus*, Peru; *Hylocryptus* (gen. n. Furnariinæ) *erythrocephalus*, Peru; *Xenops rutilus connectens*, Bolivia; *Xiphorhynchus triangularis bangsi*, Bolivia; *Thripobrotus layardi madeiræ*, Brazil; *T. warscewiczi bolivianus*, Bolivia; *Mecocerculus subtropicalis*, Peru; *Anæretes agraphia*, Peru; *Mionectes striaticollis columbianus*, Colombia; *Myioborus melanocephalus bolivianus*, Bolivia; *Basileuterus luteoviridis superciliaris*, Peru; *Pheucticus uropygialis terminalis*, Peru; *Catamenia analoides griseiventris*, Peru.

Collinge's recent papers on Economic Ornithology.

[Sea-birds: Their relation to the Fisheries and Agriculture. By Walter E. Collinge. 'Nature' of 8 Apl. 1920.]

[The food of the Nightjar. Id., Journ. Ministry Agri. xxvi. pp. 992–995. 1920.]

[Some remarks on the food of the Barn-Owl (*Strix flammea* Linn.). Id., Journ. Wild Bird Investigation Soc. i. pp. 9–10. 1919.]

In the first of these articles Dr. Collinge gives the general results of his investigation into the economics of fourteen of our commonest sea-birds. He condemns unhesitatingly the Shag and Cormorant, whose food consists entirely of fish and chiefly of food-fishes. The Common Tern is placed in class ii., largely fish-eaters but most of the fish not those species utilized for food.

The Black-headed Gull and apparently most of the other birds investigated fall in class iii., which are fish-feeders to less than 20 per cent. of the total food-bulk. Injurious insects form 22 per cent. and marine worms 18 per cent. of the food of the Black-headed Gull, and the bird is undoubtedly more beneficial than harmful.

The second article deals with the Nightjar, which is entirely insectivorous, and 88 per cent. of whose food consists of injurious insects, 12 per cent. of neutral insects, so that it is a most valuable bird and should be rigidly protected, though often persecuted for its supposed relationship to the Hawks.

The third reprint is a note from a new Journal recently started and edited by Mr. Collinge and deals with the Barn-Owl. An investigation of the stomach contents of this undoubtedly valuable bird shows that 68 per cent. of its diet consists of mice and voles, 9 per cent. of birds (sparrows, starlings, etc.), and 9 per cent. of shrews.

Cory on the Dendrocolaptine genus Siptornis.

[A review of Reichenbach's genera *Siptornis* and *Cranioleuca*, with descriptions of new allied genera and a subgenus. By Charles B. Cory. Proc. Biol. Soc. Washington, vol. 32, 1919, pp. 149–160.]

Mr. Cory proposes to divide the genus *Siptornis* as recognized by Sclater (Cat. Bds. Brit. Mus. xv.) and Brabourne & Chubb (Bds. S. Amer. i. p. 332) into five genera and one subgenus, and proposes *Pseudosiptornis* for *S. ottonis* Berlepsch; *Siptornopsis* for *S. hypochrondriacus* Salvin; *Siptornoides* for *S. flammulata* Jard.; and *Eusiptornoides* subg. n. for *Synallaxis anthoides* King, as new.

Generic characters and a key to the species now recognized with type-localities and measurements will perhaps ease the task of identification of the forms of this difficult group for future workers.

Dixon on the Wild Ducks of a City Park.

[Wild Ducks as winter guests in a City Park. By Joseph Dixon. Nat. Geogr. Mag. Washington, D.C., 1919, pp. 331–342, photos.]

The city of Oakland near San Francisco is fortunate enough to possess in its centre a fine park containing a salt-water lake of almost a square mile in extent. To it resort during the winter months large numbers of wild ducks, estimated at about 5000 at the height of the season. The species most abundantly represented are Canvassbacks (*Marila valisneria*), Pintails (*Dafila acuta*), and Baldpates (*Mareca americana*); there are also many other species as well as Coots, Grebes, and Gulls.

They are of course very carefully protected and are provided with food and water. About four tons of barley were used in 1918–19 over a period of 77 days, and a number of shallow cement drinking-basins are maintained on the lawn along the lake-shore to which the Pintails and Baldpates resort, though they are but rarely visited by the Canvassbacks and other sea-ducks.

Mr. Dixon's account is illustrated with some remarkable and beautiful photographs.

Flower on the Giza Zoological Gardens.

[Report on the Zoological Service for the years 1914 to 1919, in which are included the 16th to 21st annual reports of the Giza Zoological Gardens, pp. 1–86 and 1–26. Cairo (Govt. Press), 1920.]

Major Flower's reports for the years of the war, 1914 to 1918, are all included in one publication, while that for 1919 is issued separately. These reports deal not only with the Zoological Gardens at Giza, but with the Museum situated in the Gardens, the Aquarium at Gezira, the Zoological Survey, and the preservation of the natural fauna of Egypt—a multiplicity of activities in which the Major is assisted by Messrs. M. J. Nicoll and J. L. Bonhote. From the 1919 report we learn that Mr. Bonhote has resigned his post and returned to England while Mr. Nicoll has completed his 'Hand-list of the Birds of Egypt,' as was noticed in the April number of 'The Ibis.' The Giza Gardens appear to be in a very flourishing condition and are visited by vast numbers of people. As regards protection, the valuable Cattle Egret (*Ardea ibis*) continues to increase, as also does the Little Egret (*Ardea garzetta*) and the resident Egyptian Hoopoe; all of these species have had special efforts directed for their preservation.

Grinnell's recent papers.

[The English Sparrow has arrived in Death Valley: an experiment in nature. By J. Grinnell. Amer. Nat. liii. 1919, pp. 468–473.]

[Life-Zone indicators in California. By Harvey Monroe Hall and Joseph Grinnell. Proc. Cal. Acad. Sci. (4) ix. 1919, pp. 37–67.]

The English Sparrow though introduced into the United States in the early sixties, did not spread into southern California till about 1907, when it was noticed at Los Angeles. In 1917 Mr. Grinnell found it on a ranche in Death Valley in southern California at an elevation of about 178 feet *below* sea-level. This spot has a climate of the greatest extreme in the direction of high temperature combined with low relative humidity of any place in North America, and a temperature of 134° Fahrenheit in the shade has been recorded.

Mr. Grinnell has carefully compared the Death Valley Sparrow with others from various parts of the North American continent, and has completely failed to find any peculiarities among them. Some remarks on this natural experiment add to the interest of this note.

The distribution of animals and plants according to Life Zones depending primarily on latitude, humidity and elevation, but largely modified by local disturbing conditions, was first worked out by Dr. Merriam many years ago, and is now generally accepted by American naturalists. In this paper Mr. Grinnell and his botanical collaborator Prof. Hall have given selected lists of plants and animals, including birds, carefully drawn up as characteristic of the different life-zones in California, chiefly for the guidance and assistance of field-naturalists in that State.

J. H. Gurney's Ornithological Report.

[Ornithological notes from Norfolk for 1919. 26th annual report. By J. H. Gurney. British Birds, xiii. 1920, pp. 250–268.]

The most interesting feature of Mr. Gurney's last annual report is the account of the great mortality which occurred among the Rooks arriving on the Norfolk coasts from the sea about the end of October. A very strong easterly gale prevailed between October 28 and 30, and on the following days very large numbers of Rooks, and of some other birds, such as Hooded Crows, Starlings, Redwings, were picked up along the beaches of Norfolk and north Suffolk from Sheringham to Southwold. Only two Spoonbills visited Breydon during the spring, but the report on the Bittern is much more favourable and it appears to have established itself fairly securely on some of the Norfolk Broads as a breeding bird.

R. Gurney on the Black-headed Gull.

[Breeding Stations of the Black-headed Gull in the British Isles. By Robert Gurney, M.A., etc. Trans. Norf. Norwich Nat. Soc. x. 1919, pp. 416–447.]

In this paper Mr. Robert Gurney has put together all the information he has been able to collect in regard to the nesting places or gulleries of *Larus ridibundus*. New gulleries are frequently formed and old sites deserted, but Mr. Gurney is of opinion that this Gull is distinctly on the increase in the British Isles, a fact which may be viewed with considerable satisfaction.

As regards England there appears to be no breeding colonies in any of the central counties south of Yorkshire. One of the best known of the gulleries is the one at Scoulton in central Norfolk, which has been known since the time of Sir Thomas Browne (1605–1682), who first described it. The colony appears to be fairly constant in number, and Mr. Gurney estimates the number of birds as about 2500.

Harper on a new Hedge-Sparrow.

[A new subspecies of *Prunella modularis* from the Pyrenees. By Francis Harper. Proc. Biol. Soc. Washington, vol. 32, 1919, pp. 243–244.]

The Pyrenean Hedge-Sparrows collected by Mr. Harper in April last year at an altitude of 1700 metres (about 5100 feet), in the Dept. of Pyrénées Orientales, were found by him to be considerably greyer and less rufescent on the back and wings than those of the typical form from central

Europe or the British race, *Prunella m. occidentalis.* Mr. Harper describes the Pyrenean bird as new and calls it *Prunella modularis mabbotti*, after Mr. D. C. Mabbott, an American ornithologist who was killed in the war in France.

Hartert on the Palæarctic Birds.

[Die Vögel der paläarktischen Fauna. Von Dr. Ernst Hartert. Heft ix. pp. 1089–1216, Oct. 1914, and Heft x. pp. 1217–1344, March 1920. Berlin (Friedländer).]

We are very glad to receive two parts of Dr. Hartert's great work on Palæarctic birds and to hear that there is every prospect of the second volume being shortly completed. The manuscript is, we understand, all ready for printing and the concluding parts will be issued as soon as possible.

The first of the two parts now noticed was published just after the outbreak of the war and only one copy, that in the Bird-room of the Natural History Museum, reached this country at the time of publication. It contains the account of the Birds of Prey except the genus *Falco.* The tenth part, recently issued, deals with the Storks and Herons, forming Dr. Hartert's Order Gressores, and the Anseres, in which only one family is recognized. In accordance with Dr. Hartert's well-known views, the limits of many genera are extended beyond the common usage; for example, the Snow Geese (*Chen*) are merged with *Anser*, and all the fresh-water Ducks except the Shoveler and the Mandarin are placed in *Anas.* The Sacred Ibis bears the generic name *Threskiornis*, the generic name *Ibis* being transferred to the Wood Ibis, formerly known as *Tantalus.* This change, we believe, is inevitable if the rules of zoological nomenclature are to be adhered to, but it seems illogical to call the Ibis family Ibididæ if the generic name *Ibis* is transferred to the Wood Ibis, which is a true Stork.

We find two new subspecies tucked away in small print on page 1251—*Butorides striatus degens* from the Seychelles, and *B. s. moluccarum* from the Moluccas. In our opinion it would be more convenient to workers if such descriptions appeared first in a general Magazine or Journal of

Ornithology, especially as they have nothing to do with the Palæarctic Fauna.

Finally, we should like to draw the attention of our readers to the life-histories and the notes on the nests and eggs which form an important feature of Dr. Hartert's work, though frequently overlooked. The Vög. pal. Fauna is so generally used for identification, distribution, and correct nomenclature that these notes, necessarily much condensed, are often neglected; like the rest of the work they are most carefully compiled and authoritative.

We look forward to the early completion of this most valuable work.

Kuroda on new Japanese Birds.

[Descriptions of five new forms of Japanese Pheasants. By Nagamichi Kuroda. Dobuts. Zasshi (The Zoological Magazine), Tokio, xxxi. 1919, pp. 309-312.]

[Descriptions of three new birds from the southern Islands of Japan. Id., ibid. pp. 231–233.]

The first of these papers by our foreign member Mr. Kuroda contains, in Japanese, a review of the Pheasants found in Japan; attached to this in English are descriptions of *Phasianus versicolor robustipes* from the island of Sado and the north-western parts of Hondo, *P. v. kiusiuensis* from the southern island of Kiusiu, and *P. v. tanensis* from the island of Tanegashima; *P. sœmmeringi subrufus* from the warmer district of the Pacific side of Hondo, and *P. s. intermedius* from the island Shikoku.

In the second paper are described, in Japanese and English, *Halcyon miyakoensis* from the Loochoo Islands, a very distinct form; *Parus varius sunsumpi* from Tanegashima, one of the southern islands of Kiusiu, and *P. v. yakushimensis* from Yakushima, also one of the southern islands of Kiusiu.

McGregor's list of the Genera of Birds.

[Index to the Genera of Birds. By Richard C. McGregor. Pp. 1–185. Manilla (Bureau of Printing), 1920, 8vo.]

In this useful and laborious compilation Mr. McGregor has endeavoured to index all the generic and subgeneric names proposed for birds up to the end of 1915, with references to Bonaparte's Conspectus, Gray's Hand-list, the Catalogue of Birds, Sharpe's Hand-list, Dubois's Synopsis, and Richmond's three well-known supplementary lists of generic names.

The list contains 8839 names, while that compiled by Waterhouse in 1889 contains "over 7000," according to the preface of the work. It seems curious that no allusion is made to the last-named volume, which must surely be well known to the author.

The present list will undoubtedly be of very great use to all systematic workers, to whom we heartily commend it.

Mathews on Australian Birds.

[The Birds of Australia. By Gregory M. Mathews. Vol. viii. parts i., ii. pp. 1–144, pls. 22. London (Witherby): May, June, 1920. 4to.]

The author has now arrived at the Order Passeriformes, on which he gives us a dissertation several pages long. In this, while there is nothing very new, there is much which it is well constantly to recall, especially as regards the meaning of the terms genus, species, and subspecies, and the position of such groups in the Order.

Mr. Mathews does not wish to ignore anatomical facts, and indeed complains of the lack of such work on aberrant Australian forms; but he considers that classifications founded solely on anatomy are apt to be misleading, while, as we know, he believes strongly in colour pattern as a guide to differentiation, even in the higher groups. He thinks it likely that Australian forms may have to be segregated from their nearest, or apparently nearest, extralimital allies; but, until the cases come to hand, he follows the families admitted by Sharpe in his Hand-list.

These parts of the work include the Pittidæ, Atrichornithidæ, Hirundinidæ, and Muscicapidæ. In his summary of the first family Mr. Mathews feels great doubt whether the peculiarities of the syrinx alone are sufficient to make us create a special family to include them along with the Philepittidæ and Xenicidæ, and hints that other peculiar birds are proved to have an equally peculiar syrinx. As *Pitta versicolor* of Swainson antedates *P. strepitans* of Temminck it is accepted, while *P. simillima* is shown to be but one of three subspecies. Under *Erythropitta macklotii* and *Pulchripitta iris* subspecies are at present dropped, as these birds in each case vary much.

Everyone should read for themselves the account of the curious *Atrichornis* (Scrub-bird) and its habits; especially as it is now considered to be a degraded Passerine form rather than an ally of the Lyre-bird. The nest and eggs have recently been found, while the female has been discovered since Mr. Mathews's article was written. It should also be noticed that the western form, now separated from the eastern, is called by the author *Rahcinta*.

The Hirundinidæ are so ancient a family that almost every species might constitute a separate genus, and this is certainly so in Australia. First there is the Welcome Swallow (*Hirundo neoxena*), confounded of old with *H. javanica* and its western form *H. carteri*. Next *Cheramœca leucosternum* with three subspecies, where the confusion of the habitats has been cleared up. Thirdly, *Hylochelidon nigricans* and *Lagenoplastes ariel* with five and two subspecies respectively.

Under the family Muscicapidæ we find another general dissertation as to the value of the genera and consequently their names; some may have to be reduced to subgenera. It seems certain that there are two series of Muscicapine birds in Australia, one of which only reached the northern districts.

We cannot, of course, discuss all the species and subspecies in this huge family, but may mention some of the facts to which attention is specially drawn. The synonymy of *Micrœca fascinus* is a case in point, for Latham placed it under *Loxia*, and many authors, including Hartert, have been at variance about the subspecies, of which seven are now recognized, though only two are given of *M. brunneicincta*. *Kempia flavigaster* has five subspecies, one of which is extralimital.

Petroica is a most interesting genus in the larger sense, for Mr. Mathews divides it into no less than seven genera, each containing a single species. They are the so-called Robins of Australia, the majority of which have a red or crimson breast. It is curious that *P. multicolor* was originally described from Norfolk Island and its correct name is "boodang." There are five subspecies of this bird and of *P.* (*Whiteornis*) *goodenovii*, but only three of *P.* (*Littlera*) *chrysoptera*, and two of *P.* (*Erythrodryas*) *rhodinogaster* as well as of *P.* (*Belchera*) *rosea*.

These "Robins" are much like Chats in their habits, and this is equally true of *P.* (*Melanochryas*) *cucullata*, a pied form of which the author recognizes six races. *Amaurodryas* is the last of the *Petroica* forms, which Gould described from Tasmania as *fusca*, but had to allow that Quoy and Gaimard's *vittata* had priority. Curiously, there are three races; they all come from Tasmania and the adjacent islands.

Of *Smicrornis* only one species (*brevirostris*) is allowed, *flavescens* being reduced to the company of eleven other subspecies; but one of these is new, *S. b. mallee* from Victoria. *Gerygone olivacea* occurs in four races, while finally *G.* (*Wilsonavis*) *fusca* becomes *W. richmondi*, as Gould's name *fuscus* does not apply to this bird. Moreover, a new subspecies (*gouldiana*) is separated, from New South Wales.

Penard's recent papers.

[Some untenable names in ornithology. By Thomas Edward Penard. Proc. New England Zoöl. Club, vii. pp. 21–22. 1919.]

[Two new birds from Roraima. Id., ibid. pp. 29–31.]

[The name of the Common Jungle-Fowl. By Outram Bangs and Thomas Edward Penard. Ibid. pp. 23–25.]

[Remarks on Beebe's 'Tropical Wild Life.' By T. E. Penard. Auk, xxxvi. pp. 217–225. 1919.]

[Revision of the genus *Buthraupis* Cabanis. Id., ibid. pp. 536–540.]

[The name of the Black Cuckoo. Id., ibid. pp. 569–570.]

In the first paper Mr. Penard shows that the name *Planchesia fusca* (Bodd.) is untenable, and proposes a new name *P. pullata* for this South American Flycatcher. He also draws attention to the fact that *Muscicapa sibirica fuliginosa* (Hodgson) must be known as *M. s. cacabata* nom. nov.; *Muscicapa ferruginea* (Hodgs.) as *M. cinereiceps* (Sharpe); and *Eophona melanura melanura* as *E. migratoria pulla* nom. nov.

In the second paper Messrs. Bangs and Penard discuss the name of the Common Jungle-fowl, and following the views of Ogilvie-Grant and Kloss, and in opposition to those of Hartert, Blanford, and Baker, they accept the specific name *gallus* and designate Bengal as the type-locality.

Two new subspecies, *Chloronerpes rubiginosus roraimæ* and *Tanagra violacea rodwayi*, are described from Mt. Roraima and British Guiana in the third note.

Mr. Beebe's 'Tropical Wild Life' was noticed in 'The Ibis,' 1918, p. 187, and in the fourth paper of the list Mr. Penard points out that some of Mr. Beebe's discoveries have been anticipated by previous naturalists and explorers, and that the curious differences in the habits and structure of the tarsi of the larger and smaller Tinamous were noticed by Charles Waterton nearly a hundred years ago.

In his revision of the genus *Buthraupis* Mr. Penard divides this composite group into three genera, proposing *Cnemathraupis*, type *C. eximia* (Boisson.), and *Bangsia*, type *B. arcæi cæruleigularis* (Cherrie), as new, and retaining *Buthraupis* Cab. for *B. montana* (d'Orb. & Lafres.) and the species allied to it. Full generic diagnoses are given.

In the last note the name of the Indian Black Cuckoo is shown to be *Eudynamys scolopacea* (Linn.) instead of *E. orientalis*.

Rowan and others on the eggs of the Common Tern.

[On the nest and eggs of the Common Tern (*S. fluviatilis*). A co-operative study. W. Rowan, E. Wolff, and the late P. L. Sulman, field-workers; Karl Pearson, reporter, etc. Biometrika, Cambridge, xii. 1919, pp. 308–354, 5 pls.]

This is an elaborate metrical study on 1110 eggs of the Common Tern collected in July 1914. Comparisons with the results obtained in the previous year and published in the 10th volume of the same journal are given.

Such characters as change of type of egg with season, associations of nest and egg patterns, of nests and eggs, of green or brown colour, and mottling with size and shape of the eggs, are all considered and worked out with tables and mathematical formulæ and equations.

Less difficult to understand are some good photographs of the birds themselves as well as their nests, while the chief types of the eggs are figured in colours.

It is impossible in a short notice to analyse the results obtained, and we would refer those of our readers who are interested in such studies to the paper itself.

Shufeldt on the Monkey-eating Eagle.

[Osteological and other notes on the Monkey-eating Eagle of the Philippines, *Pithecophaga jefferyi* Grant. By R. W. Shufeldt. Philippine Journ. Sci. xv. 1919, pp. 31–58, 11 pls.]

But little is known of the anatomy and affinities of *Pithecophaga,* one of the most remarkable forms of Accipitrine birds, discovered by the late Mr. John Whitehead in the Philippine Islands, and described and figured in 'The Ibis,' by Mr. Olgivie-Grant in 1897. Dr. Shufeldt's study on the osteology of this eagle is based on the skeleton of a bird which died in captivity in the Botanical Garden at Manilla, and which was sent to him thence by Mr. McGregor. A full description of the skull and other bones is given and comparisons made with other large Accipitrine birds. Unfortunately Dr. Shufeldt was unable to secure a skull of the large South American Harpy Eagle, *Thrasaëtos harpyja*, for comparison, though he obtained the loan of an incomplete skeleton. He comes to the conclusion that so far as his osteological material permitted him to form one, that *Pithecophaga* is most nearly allied to *Thrasaëtos.* The memoir is illustrated with reproductions of photographs of the bones both of the Monkey-eating Eagle as well as of those used for the comparisons.

This memoir adds considerably to our knowledge since, so far as we are aware, nothing previously had been published in regard to the osteology of this bird.

Stresemann and Sachtleben on the Willow-Tit.

[Ueber die europaischen Mattkopfmeisen (Gruppe *Parus atricapillus*). Von E. Stresemann und H. Sachtleben. Verhandl. Orn. Ges. Bayern, xiv. 1920, pp. 228–269.]

Messrs. Stresemann and Sachtleben have prepared an elaborate memoir of the various races of the Willow-Tit found throughout Europe. Following Dr. Hartert they regard these races as subspecific forms of the American Chickadee (*Parus atricapillus*) found throughout the greater part of North America, and as quite distinct specifically from the Marsh-Tit (*Parus palustris*), which superficially it so closely resembles,

After commenting on the distribution of the species in its widest extent, its relation to *P. palustris*, its plumage development, sexual differentiation, and the variation caused by climatic conditions, the authors recognize seven distinguishable European races. A good summary of the conclusions and results of the investigation conclude an interesting, thoughtful, and thorough piece of work.

Witherby's Handbook of British Birds.

[A practical Handbook of British Birds. Edited by H. F. Witherby. Vol. i. pp. xvi + 532, 17 pls. and numerous text figures. London (Witherby), 1919–1920, 8vo.]

We must heartily congratulate Mr. Witherby and his band of helpers, Dr. Hartert, Miss Jackson, the Rev. F. C. R. Jourdain, Mr. Oldham, and Dr. Norman Ticehurst, on the completion of the first volume of the Practical Handbook.

On all sides it appears to be recognized that it contains a vast amount of reliable information packed into a comparatively small compass, and that it fills a distinct want. The first part issued was noticed in the April 'Ibis' of last year (p. 351), and we do not therefore propose in the present volume to add much to what we there wrote.

The classification adopted, for which no doubt Dr. Hartert is responsible though it is not so stated officially, follows that of the 'Vögel paläarktischen Fauna,' and the Flycatchers, Thrushes, and Warblers are all placed together in one family—Muscicapidæ; the Hedge-Sparrows and the Dippers and Wrens being kept apart. There can be no doubt that Flycatchers, Thrushes, and Warblers are difficult to distinguish, but the excellent character of the juvenile plumage, first suggested by Blanford, is undoubtedly a valuable and fundamental one and should, in our opinion, be made use of.

One other point we should like briefly to refer to. This is in regard to the generic name of the Waxwings. The name used in the present work is the less familiar *Bombycilla,* also adopted in the A. O. U. Check-list. If Dr. Hartert or any of our readers who are interested in the matter will refer to the note in the B. O. U. list of British Birds (p. 362), it would appear that there is ample grounds for retaining the use of the more familiar *Ampelis* without having to resort to the process of "elimination for type-fixing of generic names" as suggested in a note on p. 278 of the present volume.

The Auk.

[The Auk. Vol. xxxvi. for 1919, 4 nos. Cambridge, Mass.]

'The Auk' for last year contains 668 pages as compared with 826 in 'The Ibis' for the corresponding year. The larger size and somewhat smaller type of 'The Auk' make up for this, and it probably contains quite as much reading matter as our own Journal. With the limited space available it is impossible even to mention the titles of all the papers, and it will be necessary to restrict our observations to those of more general interest.

Mr. A. Wetmore has made an interesting discovery of the existence on the palate of the Icteridæ of a median sharp-edged ridge, and has observed one of the Grackles (*Quiscalus*) making use of this for shelling acorns. In the case of one of the Mexican Orioles (*Icterus gularis*) the palate is provided with a knob-like process not found in other members of the genus, and he proposes to draw attention to this peculiarity by separating this bird under the generic name *Andriopsar* proposed many years ago by Cassin. Another paper is that by Mr. W. de W. Miller on the systematic position of *Anseranas semipalmata*, the Australian Pied Goose. So remarkable are the anatomical peculiarities of this bird that, in Mr. Miller's opinion, it is entitled to family rank.

The native avifauna of the Hawaiian Islands is on the verge of extinction, but there is, according to Mr. V. MacCaughey, one native bird which is still fairly abundant. This is the Elepaio (*Chasiempis*), an aberrant Flycatcher, of which there are three distinct forms inhabiting three separate islands. Mr. MacCaughey discusses the habitats, nesting and other habits, calls and songs, of this form, and endeavours to explain its present distribution from the past geological history of the island group.

Among regional or faunal papers, Mr. P. A. Taverner records his experiences and explorations on the Red Deer river of Alberta, down which he travelled in a "scow-shaped boat with a portable motor a distance of some 217 miles." The fruitful Okanagan valley of British Columbia is dealt with by Mr. J. A. Munro, while Messrs. P. B. Philipp and B. S. Bowdish have continued their explorations of New Brunswick and have photographed some rare nests, especially that of the Cape May Warbler (*Dendroica tigrina*). Mr. W. J. Erichsen has explored the coastlands of Georgia, and Major C. H. Pangburn the swamps and bayous of western Florida. Lastly, Mr. T. D. Burleigh, who was stationed in the Landes district of south-western France during the war in connexion with forest work, has a wonderful list of ninety birds, all of which appear to have been recognized by sight alone.

Two papers by Mr. L. M. Loomis deal with dichromatism. In the one is figured a remarkable instance in the case of the dark- and light-coloured nestlings of *Diomedea irrorata*, the Albatross breeding in the Galapagos, as well as the variation in size and shape of the bills of the adults. In the other paper the light and dark forms of the Wedge-tailed Shearwater (*Puffinus chlororynchus*) are figured and discussed.

Mr. Loomis believes that these variations should be treated on the subspecies basis equally with geographical races or variations.

Among new forms described perhaps the most striking is the discovery by Mr. F. H. Kennard of a new form of Blue-winged Teal (*Querquedula discors albinucha*) which he found in Louisiana: it is apparently a resident in the southern States, and remains to breed when the ordinary typical form has gone further north in spring. Only the adult males appear to be distinguishable; the white of the crescent-shaped mark in front of the eye is continued back along the side of the head to the nape, a character clearly indicated in a plate accompanying the description.

Other new North American races described are *Piranga hepatica oreophasma* Oberholser, from S.W. United States to C. Mexico; *Hedymeles melanocephalus papago* Oberholser, from the Rocky Mts. region; and *Thryospiza mirabilis* Howell, from Cape Sable, Florida. Three short papers by Mr. Cory contain descriptions of new South American forms, including two new genera, *Xenicopsoides* for type *Anabazenops variegaticeps* P. Scl., and *Euphilydor* for type *Philydor lichtensteini* Cab. & Hein. Mr. Oberholser continues his series of Notes on North American Birds, dealing chiefly with the question whether certain forms should be regarded as subspecies or full species, and he also prints the fourth list of the proposed (but not yet adopted) changes in the A.O.U. Check-list.

A biographical notice with portrait of Mrs. Olive Thorne Miller, a well-known popular writer on birds as well as on other subjects, who died at the age of 87, the oldest member of the Union, is contributed by Mrs. Bailey. Mrs. Miller wrote 780 articles and 24 books, eleven of them on birds. In another biographical article by Mr. Stone all the information available is collected about Jacob Post Geraud (1811–1870), a somewhat mysterious and elusive personality. He was the author of "The Birds of Long Island," 1844, and of "Sixteen new birds from Texas," 1841, both now excessively rare works; the latter is not in the British

Museum (Nat. Hist.) library. He gave his collections and a legacy of $30,000 to Vassar College, the well-known institution for the higher education of women.

Avicultural Magazine.

[The Avicultural Magazine, being the Journal of the Avicultural Society for the study of Foreign and British Birds in freedom and captivity. 3rd ser. Vol. x., 14 nos. Nov. 1918 to Dec. 1919.]

The volume of the 'Avicultural Magazine' for last year contains fourteen numbers, so as to make each volume in future correspond to the calendar year—an excellent change. We also notice that a decided effort is being made to amalgamate the Magazine with 'Bird Notes,' the organ of the Foreign Bird Club. We hope that this may be brought about, as it will then be possible to concentrate the material and effect considerable economies by publishing only one magazine instead of two, for which there seems hardly enough demand.

The volume before us contains a number of articles from former contributors, such as Dr. Butler, Mr. W. Shore Baily, and Mr. Astley, but we regret to notice how frequently the editor, Mr. Graham Renshaw, has had to resort to paste and scissors, and to reprint articles from American and Australian sources.

Dr. Butler and Dr. V. C. L. van Someren run a tilt on the old controversy of the change of colour in grown feathers, and discuss the cases of *Pyromelana* and the turacin pigment of the Touracos. Mr. Hopkinson concludes his account of the Pigeons of the Gambia, and Lieut. Delacour writes on the flourishing state of the Zoological Gardens at Cologne, which he contrasts with his own devastated aviaries on his estate at Villers-Bretonneux. An interesting note by Miss E. Maud Knobel deals with the moult of the outer tail-feathers of an Alexandrine Parrot, of which careful record has been kept each year from 1915 to 1919. During this time the date of shedding has advanced from June 8 to July 8, and the length of the feathers has increased from 13⅜ and 13⅛ inches right and left in 1915 to 14½ and 14⅛ inches in 1919.

Mr. W. H. St. Quintin wins the Society's medal for the successful breeding of the Lesser White-footed Goose in captivity in Britain for the first time, and M. Decoux the Society's prize for his account of the breeding of hybrid Melba Finch × Crimson-eared Waxbill.

The volume is illustrated by a number of very successful photographs, but it has not yet been found possible to issue any coloured plates.

The Bombay Journal.

[The Journal of the Bombay Natural History Society. Vol. xxvi., parts 1-4. Dec. 1918-Jan. 1920.]

The Bombay Journal for 1919 forms a stout volume of over a thousand pages, and contains a great deal that is of interest to the ornithologist as well as to students of other branches of natural history. Four parts of Mr. Stuart Baker's monograph of the Indian Game-birds deal with the Cheer, the Fire-back Pheasants, the Monals, and the Tragopans, and are illustrated with fine coloured plates of *Catreus wallichii*, *Lophophorus impejanus* (plate labelled *L. refulgens*), and *Tragopan blythi*.

Mr. C. H. Donald continues his account of the Birds of Prey of the Punjab. It is a useful paper dealing with fifty-six out of the eighty-two known Indian species, and contains keys, descriptions, and notes on habits, while the task of identifying the birds on the wing is rendered more easy by a series of outline diagrams of the birds as seen when flying directly overhead. Mr. H. Whistler completes his list of the birds of Ambala, and contributes two others on the birds observed by him in the Ludhiana district and near Fagoo—the first two localities in the plains and the last in the Himalaya of the Punjab. Capt. C. B. Ticehurst describes a new Bulbul from Mesopotamia, *Pycnonotus leucotis mesopotamia*, and in another paper enumerates eight races of the Common Starling occurring in Asia besides mentioning five others of uncertain status. Mr. A. E. Jones enumerates the birds of the Simla hills, and Messrs. Inglis, Travers, O'Donel and Sherbeare the vertebrates of the Jalpaiguri district of Bengal, lying at the foot of the Himalaya. It seems a pity that these two last lists do not contain more precise information of the exact height at which the birds nest. There is ample opportunity for more work on the altitudinal distribution of Himalayan birds on the lines of the zonal work carried out so completely in North America, more especially as it is in this region that the Palæarctic and Indian faunas meet.

'British Birds' Magazine.

[British Birds: An illustrated Magazine, etc., etc. Vol. xiii., 12 nos. June 1919–May 1920.]

This is a very good volume of 'British Birds,' and contains a very large number of valuable contributions. Miss Turner records a number of further details of the nesting habits of the Bittern in the Norfolk broads, with a list of nests watched and a good series of her well-known photographs. There seems no reason why the Bittern should not be completely and permanently re-established as a breeding bird in England. Mr. J. S. Huxley sends a short notice of the drumming habit of the Spotted Woodpeckers, which is undoubtedly due to a rapid series of blows on a dead log with the beak. A very similar habit often observed by Mr. Huxley is characteristic of the American Red-headed Woodpecker (*Melanerpes erythrocephalus*). Another paper by the same author deals with the sexual habits of the Little Grebes. As these birds have no tufts or special sexual plumage adornments, he finds that vocal duets appealing to the ear appear to take the place of the dance-like displays appealing to the eye which characterize the other Grebes.

Mr. E. Chance contributes some detailed observations on the Cuckoo. Between May 18 and July 5 he found eighteen nests of the Meadow-Pipit in a restricted area in Worcestershire, in which he believes a single individual Cuckoo had deposited her eggs. He believes that the clutch of a Cuckoo depends on the facilities afforded and that the number of eggs laid is quite indefinite. It would perhaps have been better if Mr. Chance had confined himself to observation, but he tried a good many experiments in the matter of removing and exchanging eggs in the nest, which must bring into play other factors and cause unnatural conditions.

Mr. C. Suffren has invented an ingenious diagrammatic method of recording migration as observed in the Mediterranean. He believes that apart from the well-known Gibraltar–Marocco line there are at least three other air routes across the Mediterranean, *i. e.*, Riviera, Corsica, Sardinia, Cape Bon ; Italy, Sicily, Malta, Tunis ; and Greece, Crete, Egypt.

The nesting habits of the Black-necked Grebe on the Tring reservoirs are illustrated and described by Mr. O. G. Pike ; those of the Oyster-catcher in the Tay valley by Mr. J. M. Dewar, and those of the Storm Petrel among the Hebrides by Miss Audrey Gordon ; and finally, Col. Feilden contributes some photographs of the nest, eggs, bird and nest-site of the Knot, obtained in Grinnell Land in 1908–9 by Admiral Peary when he travelled to the North Pole. Col. Feilden himself found young birds in down, but no eggs, on almost the same spot thirty years previously in 1876, when naturalist to the British Arctic Expedition.

The longest article in the volume is that of Dr. Norman Ticehurst on the birds of Bardsey Island, off the north-western coast of Wales. In company with Mr. J. K. Stanford, he visited the island twice in 1913, and the results of his observations, especially of the autumn migratory movements, extend over six numbers of the magazine.

A black-letter pamphlet published in 1586 contains what is probably the earliest account of the Ruff as it was then commonly found in Lincolnshire. A wood-block in the pamphlet illustrating the bird was almost entirely copied by Aldrovandus in his History of Birds published at Bologna in 1603. This pamphlet is described by Mr. W. H. Mullens, who possesses an unrivalled library of British Bird-books.

The American Goshawk, though recorded in Scotland and Ireland in 1869 and 1870, was not recognized as British by Saunders. It was placed in the appendix of "uncertainties" in the B. O. U. list. A new record of an example killed in county Tyrone, Ireland, in February 1919 is made by

Mr. W. J. Williams. Another British bird is newly named by Mr. Witherby. He proposes to separate the Little Owl of north Europe from Hamburg to Holland from the typical form of southern Europe, on account chiefly of its darker colour, under the name *Athene noctua mira*. It is the new subspecies which has been introduced and which has spread all over the south and east of England of late years. There are some other changes in nomenclature and status for inclusion in the third supplement to the 'Hand-list of British Birds.'

Finally, we must add a few words about the British Birds marking scheme. Two reports, for 1918 and 1919, appear in the volume. The number of birds ringed in the last-named year shows a falling off, but still there are many interesting results. A Swallow ringed in Yorkshire as a nestling in August 1918 was recovered in East Griqualand, Cape Colony, in February 1919. This is the fourth instance of such an occurrence. In another paper prepared by Mr. Witherby himself, he has brought together a number of very interesting results collated from the reports up to date in regard to certain species of birds. Undoubtedly this method of working has added to our knowledge of the movements of our British birds when they leave these shores.

French Review of Ornithology.

[Revue Française d'Ornithologie Scientifique et Pratique. 11e Année, nos. 117–128. Jan.–Dec. 1919.

M. Menegaux has managed to keep his excellent Journal going throughout the war, but we notice that he has now found himself compelled to raise the subscription from ten to twenty francs a year, owing to the enormous rise in the cost of book-making.

The volume for 1919 contains a number of useful and interesting contributions, but we fear we can only mention a few of them. There are several articles dealing with the protection of birds especially in the south, where destruction by nets and guns seems much more severe than in the north, and MM. A. Godard, J. Bailly Maitre, and A. Hugues all send articles on this important question. In this connection moreover, we are glad to notice that the Flamingo is to be specially protected in future in its breeding-places at the mouth of the Rhone.

In most birds the wing of the bird is about three to five times the length of the tarsus. M. M. Bouvier has drawn up a table showing this correspondence, and points out that in the long-winged birds the tarsus becomes very much shorter in proportion: for instance, in the Swallow the wing is twenty-five times the length of the tarsus; and in the short-winged birds the reverse is the case, as, for instance, in the Stilt the wing is about twice the length of the tarsus. Another paper by the same author deals with the distribution of the Penguins, and endeavours to explain some of the remarkable facts.

An important paper by Dr. A. Rochon-Duvigneaud contains an exposition on bird vision, in regard to which he is endeavouring to throw more light. At the end of the paper is a "questionnaire" asking for information and observations on various moot points.

M. Menegaux himself has collected a good deal of information on the alleged disappearance of the Common Sparrow in many parts of the south of France; he has also completed his account of a collection of birds made at Misiones in Argentina. M. J. L'Hermitte has some notes on the birds of Grenoble (Isère) and of Lantaret (Hautes Alpes); Mr. G. R. Mayfield of Tennessee, U.S.A., gives a list of 102 birds observed by him near Sézanne in Champagne; and M. P. Bédé notices the occurrence of the Cormorant at Sfax in Tunisia and discusses the subspecies. Finally, M. E. Simon proposes with diagnoses and types fifteen new genera of Humming-birds (Trochilidæ).

Rivista Italiana di Ornitologia.

[Rivista Italiana di Ornitologia. Anno Quinto. MCMXIX. Published 1920.]

We are glad to receive a new part of the Italian ornithological journal, the publication of which has been somewhat irregular of late, and the present one contains a number of interesting articles, though we miss the name of Count Salvadori from among those of the contributors.

Sig. A. Trischitta writes on the occurrence of *Phalacrocorax pygmæus* on the coast of Sicily, and also on the recorded examples of the three species of Skua in the same seas. Sig. G. Vallon has an article on the effects of the war in northern Italy on nidification and migration, and also sends a diary of his ornithological rambles in the Friuli region in the north-eastern corner of Italy.

A fine collection of Italian birds recently bequeathed to the University Museum of Bologna affords Sig. E. Ninni an opportunity to describe two hybrids—*Anas boscas* × *Dafila acuta* and *Fringilla montifringilla* × *F. cœlebs.* He also illustrates and describes some curious monstrosities of beaks and legs, chiefly among Larks. Another paper dealing with hybrids is by Prof. A. Ghigi, whose studies have been made on the results of crossing the domestic pigeon with *Columba leuconota.* He believes that some of the oriental races of domestic pigeons have had their origin, at any rate in part, from *C. leuconota.* Finally, Dr. N. Alippi has a long article on the birds of accidental occurrence in Italy and of their value in migration work; data as to the season and place of arrival and whence and under what conditions they arrived are given, and these data are illustrated with a number of outline maps.

Scottish Naturalist.

[The Scottish Naturalist. A monthly magazine devoted to Zoology. 1919. Six double numbers, 85–96.]

Like other journals, the 'Scottish Naturalist' has had to reduce its output and now appears in bi-monthly numbers six times a year. As usual, its pages contain a considerable proportion of ornithological matter. Mr. F. S. Beveridge completes his list of the birds of North Uist, and Mr. D. Guthrie, who has spent some twenty-two years on the island, sends some notes on the birds of South Uist where, however, only ten Passerine birds are noted. The Editor (and our

President), Dr. Eagle Clarke, has found an interesting notice in an old Scots history—The Scotichronicum—to the effect that a pair of White Storks nested on the top of the tower of St. Giles Church in Edinburgh in 1416, and after bringing up their young disappeared again. This seems to be the only record of the breeding of the Stork in the British Islands. Mr. Wm. Evans opens a discussion on the often-disputed statement of the Woodcock carrying away its young when the nest is disturbed. Though not denying that Woodcock may sometimes do so, his experiences lead him to believe that in most cases they "feign" to do so in order to attract attention away from the nest, where the young birds remain all the time. Mr. Wm. Evans and also the Misses Baxter and Rintoul contribute articles on the nesting of the Crested Grebe in Scotland, where of recent years it has become much more plentiful; the two ladies have collected and codified both locally and chronologically all the information available.

As usual, the July–August number is devoted to the Report on Scottish Ornithology for 1918 prepared by the Misses Rintoul and Baxter; in this are included accounts of migration movements and ringing results, extensions of breeding range, notes on birds new to faunal areas, and extensions of breeding ranges and other information, all codified and arranged for easy reference.

List of other Ornithological Publications received.

Chapman, R. Unusual types of apparent geographic variation in color, etc. (Proc. Biol. Soc. Washington, vol. xxxiii. pp. 25–32.)

Cory, C. B. Catalogue of Birds of the Americas. (Pt. ii. no. 2. Chicago, 1919.)

Grinnell, J. Notes on the Elegant Tern as a bird of California. (Condor, xxi. pp. 230–234.)

Grinnell, J. Sequestration Notes. (Auk, xxxviii. pp. 84–88.)

Hellmayr, C. E., and Laubmann. Nomenclator der Vögel Bayern. (München, 1916.)

Hellmayr, C. E., and Laubmann. 10 reprints from Verhandl. Orn. Ges. Bayern, vols. xii.–xiv.

Lönnberg, E. The Birds of the Juan Fernandez Islands. Notes on Birds from Easter Island. (From 'The Natural History of Juan Fernandez and Easter Island,' edited by Carl Skottsberg, vol. iii.)

McClymont, J. R. Essays on Early Ornithology. (London, 1920.)

Mullens, W. H., Swann, H. K., and Jourdain, F. C. R. A Geographical Bibliography of British Ornithology. Pt. 6. (London, 1920.)

Oort, E. D. van. Ornithologia Neerlandica. Pts. 3–8. ('s Gravenhage, 1919–1920.)

Peters, J. L. A new Jay from Alberta. (Proc. N. Engl. Zoöl. Club, vii. pp. 51–52.)

Riley, J. H. Four new birds from the Philippines and Greater Sunda Islands. (Proc. Biol. Soc. Washington, vol. xxxiii. pp. 55–58.)

Robinson, H. C., and Kloss, C. B. On a collection of Birds from N.E. Sumatra. (Journ. Straits Branch R. A. Soc. no. 80, pp. 73–133.)

Robinson, H. C., and Kloss, C. B. On the proper name of the Red Jungle Fowl from Peninsular India. (Rec. Indian Mus. xix. pp. 13–15.)

Stresemann, E. Avifauna Macedonica. (München, 1920.)

Swarth, H. S. The subspecies of *Branta canadensis* (Linnæus). (Auk, xxxvii. pp. 268–272.)

Taverner, P. A. Birds of Eastern Canada. (Ottawa, 1919.)

Taverner, P. A. The Birds of the Red Deer River, Alberta. (Auk, xxxvi pp. 1–21, 248–265.)

Taverner, P. A. Bird-houses and their occupants. The Birds of Shoal Lake, Manitoba. (Ottawa Nat. xxii. and xxiii.)

Todd, W. E. C. Preliminary diagnoses of apparently new South American Birds. (6 reprints from Proc. Biol. Soc. Washington, vols. xxviii.–xxxii.)

Townsend, C. H., and Wetmore, A. Reports on the scientific results of the Expedition to the tropical Pacific in charge of Alexander Agassiz on the U.S. Fish Commission Steamer 'Albatross,' etc. Birds. (Bull. Mus. Comp. Zoöl. lxiii. pp. 151–225.)

Warren, E. R. Bird notes of a stormy May in Colorado Springs. (Condor, xxi. pp. 62–65.)

Wetmore, A. Lead poisoning in Waterfowl. (Bull. no. 793, U.S. Dept. Agriculture.)

Wetmore, A. Notes on the structure of the palate in the Icteridæ. (Auk, xxxvi. pp. 190–197.)

Wood, C. A. The eye of the Burrowing Owl. (Contrib. Med. Biol. Res., dedicated to Sir Wm. Osler, 1919.)

Aquila. (Vols. xxi.–xxv. 1914–1918.)

Austral Avian Record. (Vol. iv. nos. 1–3.)

Auk. (Vol. xxxvi. nos. 1–3.)

Avicultural Magazine. (Vol. xi. nos. 3-9.)
Bird-Lore. (Vol. xxii. nos. 1–4.)
Bird-Notes. (3 ser. vol. iii. nos. 1–8.)
British Birds. (Vol. xiv. nos. 1–4.)
Brooklyn Museum Quarterly. (Vol. vii. nos. 2–3.)
Bull. Soc. Zool. Genève. (Vol. ii. fasc. 13–18.)
Canadian Field-Naturalist. (Vol. xxxiv. nos. 1–2.)
Club van Nederl. Vogelkund. Jaarber. (No. 10, pts. 1–2.)
Condor. (Vol. xxii. nos. 1–4.)
El Hornero. (Vol. i. no. 4.)
Fauna och Flora. (1920, nos. 1–4.)
Gerfaut. (Vol. x. fasc. 1–2.)
Irish Naturalist. (Vol. xxix. nos. 1–9.)
Journ. Fed. Malay States Mus. (Vol. ix. pt. 1; vol. x. pt. 1.)
Journ. Mus. Comp. Oology. (Vol. i. nos. 3–4.)
Journ. Nat. Hist. Soc. Siam. (Vol. iii. no. 4; vol. iv. no. 1.)
Orn. Monatsber. (Vol. xxviii. nos. 9–10.)
Rev. Museu Paulista. (Vol. xi.)
Rev. d'Hist. nat. appl. L'Oiseau. (Nos. 1–8.)
Rev. Française d'Ornithologie. (Nos. 130–137.)
Scottish Naturalist. (Nos. 99–104.)
South African Journal of Nat. Hist. (Vol. ii. no. 1.)
South Australian Ornithologist. (Vol. v. nos. 1–3.)
Tori (The Aves). (Vol. ii. no. 9.)

XXXVII.—*Letters, Extracts, and Notes.*

The Last Phase of the Subspecies.

Sir,—The student entering upon the study of systematic ornithology to-day will find much diversity of opinion respecting the status of the subspecies. One author would have "practical subspecies," another "sane subspecies," and another, subspecies *ad infinitum*. One would partially suppress subspecies by placing their names beneath bold specific captions, and another would eliminate subspecific names from captions and make "pronouncements" in the body of the text. After nearly half a century of the theory and practice of subspeciation, the result is this confusion of tongues. The cause is not far to seek; for the subspecies is the outcome of incomplete investigation.

At the outset conspicuous geographic variations were mistaken for constant characters and described as species. When larger series were available for study, the mistake was partially discovered, and the apocryphal species were demoted to the rank of varieties. Later, the term variety was superseded by the term subspecies. It was assumed that geographic variations are incipient species. There is no valid reason for such an assumption. We are not endowed with the gift of prophecy, and can not foretell the remote future of any variation having evolutionary possibilities. It matters not whether the variation be geographic, dichromatic, or individual. Moreover, it is not known how existing bird species were evolved. The manner of the unfolding is lost in the mists of the past.

Dichromatic variations (possible saltations) have also fared ill at the hands of systematists. Many such variations have been described as species. Some of them were ultimately identified as colour phases of species. Others, because of differences in the geographic distribution of phases and lack of correlation with environmental conditions, were relegated to the category of intergrading species.

In nature, fundamental bird units abound. The individuals composing these units possess a peculiar assemblage of characters, an assemblage that absolutely separates them from all other bird individuals. These units are conventionally styled species. Called by any other name, they would be as real. Geographic and dichromatic variations are inconstant variations within bird units. If trinomial or binomial names are applied to these variations, a false impression of unity is conveyed that is difficult to expel from the mind when once entertained. In short, no magic words or question-begging phrases can make geographic and dichromatic variations units.

It has often been urged that the subspecies theory is a convenient scheme for handling geographic variations and an important aid in tracing migration routes. One has only to read a recent systematic monograph of a bird group, treated on the subspecies basis, to learn that the author has entered an interminable maze from which there is no escape save to retreat and recognize all inconstant variations as variations of species units. Furthermore, in the study of bird migration, it is not trinomial, but the fact of geographic variation that aids in determining migration routes.

Engineers tell us that the strength of a structure is primarily the strength of its foundation. The foundation of the subspecies is an unstable variation, and in consequence the structure is collapsing. Hasten the day when we shall view its ruins with the same complacency as we view the ruins of the Quinary System.

Yours truly,

San Francisco,
26 July, 1920.

LEVERETT MILLS LOOMIS, F.A.O.U.

Birds of Texel.

SIR,—To the list of birds found in Texel contained in Dr. C. B. Ticehurst's valuable paper (Ibis, 1920, p. 361) I can add four species. On the 8th of May, 1907, I saw a Hoopoe on the wing. A (very) Mealy Redpoll (apparently a female) was feeding in some willows, eating the catkins or something on them, on the 19th of May, 1908. I saw three Black-winged Stilts on one of the meres near the west coast (where they had been seen the day before) on the 14th of May, 1907; and on the same day, on an adjoining mere, I spent some time watching a pair of Black-necked or Eared Grebes, which I have no doubt were nesting, or going to nest, in a big but thin reed-bed. They were in full summer dress, and, to judge from the many times the ordinary cry of *blidder* was uttered from the inside of the reed-bed, as well as by the birds I watched, I thought there were more Eared Grebes there.

As to the birds mentioned in the paper referred to, I should like to say that I saw Crested Larks in two places near Hoorn on the 25th of May, 1908, and had no doubt that this sedentary species was breeding there, although I did not find a nest. The Stonechat is a probable breeder. I saw it on heath-land on the 12th of May, 1907. With regard to the Sandwich Tern breeding, I saw in the Museum at the Amsterdam Diergarten eggs taken in Texel as long ago as May 1890.

Yours truly,
O. V. APLIN.

Bloxham, Oxon,
20 August, 1920.

Special Meeting of the Union.

Members are reminded that a Special General Meeting of the Union will be held at Pagani's Restaurant, Great Portland Street, at 6 P.M. on Wednesday, the 13th of October next, to consider the recommendation of the Committee that the subscription to the Union be raised from 25*s.* per annum to £2 per annum.

Members of the Union who are not members of the Club are invited to join in the dinner which will be held the same evening at the same place at 7 P.M. The dinner is 6*s.* 6*d.*, without wine.

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